Appendix 2: Mass scattering efficiencies and corresponding Notes tables and citation list.

Table 2. Summary of a literature survey of mass scattering efficiencies using the **theoretical method.** The first column corresponds to the reference number and entry in the associated notes table. Entries correspond to the fine mode unless otherwise stated in the column heading, or noted with superscripts.

Theoretical Method Mass Scattering Efficiency ($m^2 \ g^{-1}$)*									
Note	Fine Mode	Coarse Mode	Total Mode	Sulfate	POM	Dust	Sea Salt	Location/ Study/ Characteristic	Time
1[1]			1.4 ± 0.7					Baltimore, MD Canadian smoke (Supersite)	Jul 4,6,10 2002
3[2]				3.8 2.8†				Great Smoky National Park, TN (SEAVS)	Jul-Aug 1995
10[3]						1.07♦	0.52♦	Sal Island, Cape Verde	Dec 1991, Jan 1994, Dec 1994- Feb 1995
17	3.4	0.6						Big Bend National Park, TX (BRAVO)	Jul-Oct 1999
19a[4]				3 0.9†				Santa Maria, Azores	Jun 10, 1992
19b[4]				28 2.4†				Santa Maria, Azores	Jun 13, 1992
19c[4]				13 3.3†				Santa Maria, Azores	Jun 19, 1992
19d[4]				9.1 2.5†				Santa Maria, Azores	Jun 20, 1992
19e[4]				5.2 1.6†				Christmas Island	Aug 3, 1994
22[5]				6.9 6.0†,♦	5.3 2.9	0.64‡	1.3‡	Waliguan Mountain, Qinghai Province, China	Oct-Nov 1997, Jan 1998
29a				2.23				Hopi Point, Grand Canyon National Park, AZ	Jan-Feb 1998
29b				2.59				Hopi Point, Grand Canyon National Park, AZ	Jan-Feb 1998
29c				4.81				Hopi Point, Grand Canyon National Park, AZ	Jan-Feb 1998
29d				2.03				Meadview, AZ	Summer 1992
29e				2.05				Meadview, AZ	Summer 1992
29f				2.11				Meadview, AZ	Summer 1992

Note	Fine Mode	Coarse Mode	Total Mode	Sulfate	POM	Dust	Sea Salt	Location/Study/Characteristic	Time
29g				*2.63*				Shenandoah National Park, VA	Summer 1990
29h				3.81				Shenandoah National Park, VA	Summer 1990
29i				18.23				Shenandoah National Park, VA	Summer 1990
31a				*2.4*				Great Smoky National Park, TN (SEAVS)	Jul-Aug 1995
31b				3.58				Great Smoky National Park, TN (SEAVS)	Jul-Aug 1995
31c				9.64				Great Smoky National Park, TN (SEAVS)	Jul-Aug 1995
32				3.15 $2.96^{†}$				Big Bend National Park,TX (BRAVO)	Jul-Oct 1999
33	4.21							Yosemite National Park, CA (YACS)	Jul-Sep 2002
34[6]						$0.48^{‡}$		Izana, Tenerife, Canary Islands	Jul 1999
37	4.3							Yosemite National Park, CA (YACS)	Jul-Sep 2002
43[7]	3.6	0.87		$5^{♦}$ $2.8^{♦}$ $3.6^{†,♦}$,				Pacific Ocean and Cheeka Peak, WA (PSI and MAGE)	1991 & 1992
45[8]	3.2±0.3			0.84±0.09, 1.5±0.2, $1.12^{†}$			4.1±0.4	Southern Ocean Region (ACE1)	Nov-Dec 1995
46[9]				$4^{♦}$ $1.7^{†,♦}$	$3.3^{♦}$	$1.1^{♦}$	$1.6^{♦}$	Norfolk, VA to Cape Town, South Africa (Aerosols99)	Jan–Feb 1999
46[10]	4.8±0.5			3.5±0.7 4.4±0.9, $1.83^{†}$	6.4±1.1 $7.2±1.8$	3.6±0.8	6.0±0.7	Norfolk, VA to Cape Town, South Africa (Aerosols99)	Jan–Feb 1999
46[11]		1.02±0.05			$1.7±0.4^{‡}$ $1.9±0.5^{‡}$	$0.60±0.07^{‡}$	$1.12±0.16^{‡}$	Norfolk, VA to Cape Town, South Africa (Aerosols99)	Jan–Feb 1999
48[12]				$4.9^{♦}$ $2.04^{†,♦}$	$4.1^{♦}$ $3.6^{♦}$	$1.5^{♦}$	$1.6^{♦}$	Indian Ocean (INDOEX)	Feb-Mar 1999
48[13]	4.5±0.5			3.9±0.8 5.0±0.9, $2.06^{†}$	6±1 $5±1$	3.4±0.4	5.5±0.3	Indian Ocean (INDOEX)	Feb-Mar 1999
48[14]		2.4±1.2		$3.7±0.6^{‡}$ $3.9±0.5^{‡}$, $1.6^{†,‡}$	$4.1±0.9^{‡}$ $3.6±0.8^{‡}$	$0.8±0.3^{‡}$	$1.06±0.7^{‡}$	Indian Ocean (INDOEX)	Feb-Mar 1999

49[15]	4.3±0.6			3.8±0.7 *2.5±0.3*†	5.3±0.7 *4.7±0.6*	3.4±0.3	5.0±0.5	Pacific Ocean, coastal Asia (ACE-ASIA)	Spring 2001
49[16]		1.4±0.6		3.2±0.4‡	2.0±0.3‡ *1.8±0.2*‡	0.67±0.16‡	1.6±0.2‡	Pacific Ocean, coastal Asia (ACE-ASIA)	Spring 2001
49[17]			2.5±0.9♦	3.7±0.6♦	4.4±0.7♦ *3.9±0.6*♦	1.2±0.4♦	2.8±0.4♦	Pacific Ocean, coastal Asia (ACE-ASIA)	Spring 2001

Footnotes for theoretical method table

*All values reported for a wavelength of 550 nm unless otherwise stated in the Theoretical method note table. Values correspond to fine mode unless otherwise noted in the column header or by foot note. Size ranges and relative humidity (when reported) are stated in the Theoretical method note table or in the footnotes. Theoretical method includes mixed ('specific'), externally mixed, and mixed/apportioned methods, also found in the Theoretical method note table for each entry.

In the "sulfate" column, values corresponding to dry ammonium sulfate are italicized.
In the "POM" column, values we normalized to POM multiplier of 1.8 are italicized

† We converted to dry ammonium sulfate
‡ Corresponds to coarse mode (supermicron)
♦ Corresponds to total modes (supramicron, fine + coarse)

[1] Average and standard deviation of three time periods (see notes 1a, 1b, and 1c).
[2] Sulfate is ion, $Dp < 3$ µm
[3] Dust and sea salt are for $Dp < 8.75$.
[4] Sulfate is ion for $0.32 < Dp < 10$ µm
[5] Sulfate is bisulfate in the accumulation mode. Organic carbon is in the accumulation mode. Dust and sea salt correspond to coarse mode.
[6] Dust is coarse mode.
[7] Sulfate is ion and sulfate aerosol (nss-SO4+NH4+ H2O), and corrected dry ammonium sulfate aerosol. respectively, for $Dp < 10$ um. Mixed fine corresponds to residual mass for $Dp < 1$ µm and mixed coarse corresponds to residual mass for $1 < Dp < 10$ µm (see notes 43a and 43b).
[8] $Dp < 1$ µm. Average and standard deviation of estimates corresponding to air masses for short (< 5 days), long (>= 5 days) marine boundary layer residence times, and perturbed air masses. Sulfate is dry (30-45%) ammoniated sulfate mass, sulfate ion and corrected dry ammonium sulfate from ion, respectively (see notes 45a-f).
[9] Sulfate is ion, and corrected dry ammonium sulfate. $Dp < 10$ µm (see note 46a), RH = 55 %.
[10] $Dp < 1.1$ µm. Average and standard deviation of values corresponding to North America, Northern Hemisphere marine, African dust, African dust/biomass burning, and biomass burning. Sulfate is wet ammoniated sulfate mass (55 % RH), sulfate ion and corrected dry ammonium sulfate from ion, respectively, (see notes 46a-k).
[11] $1.1 < Dp < 10$ µm. Average and standard deviation of values corresponding to North America, Northern Hemisphere marine, African dust, African dust/biomass burning, and biomass burning. Sulfate is wet ammoniated sulfate mass (55 % RH), sulfate ion and corrected dry ammonium sulfate from ion, respectively (see notes 46l-p).
[12] $Dp < 10$ µm. Sulfate is ion (see note 48a).
[13] $Dp < 1.1$ µm. Average and standard deviation of values corresponding to SH Atlantic, SH Indian Ocean, NH Indian Ocean, East Indian Subcontinent, Indian Subcontinent, Arabia, Arabian-Indian Subcontinent and Arabian Sea-Coastal India. Sulfate is wet ammoniated sulfate mass (55 % RH), sulfate ion and corrected dry ammonium sulfate from ion, respectively (see notes 48a-q).
[14] $1.1 < Dp < 10$ µm. Average and standard deviation of values corresponding to SH Atlantic, SH Indian Ocean, NH Indian Ocean, East Indian Subcontinent, Indian Subcontinent, Arabia, Arabian-Indian Subcontinent and Arabian Sea-Coastal India. Sulfate is wet ammoniated sulfate mass (55 % RH), sulfate ion and corrected dry ammonium sulfate from ion, respectively (see notes 48r-cc).
[15] $Dp < 1.1$ µm. Average and standard deviation of values corresponding to Polluted-Korea/Japan, Polluted-Japan, Volcano+Polluted, dust+Frontal, Dust+Korea, and Dust+Shanghai. Sulfate is sulfate aerosol (nss-SO4+NH4+H2O, RH = 55 %) and corrected to dry ammonium sulfate (see notes 49a-f).
[16] $1.1 < Dp < 10$ µm. Average and standard deviation of values corresponding to Polluted-Korea/Japan, Polluted-Japan, Volcano+Polluted, dust+Frontal, Dust+Korea, and Dust+Shanghai. Sulfate is sulfate aerosol (nss-SO4+NH4+H2O, RH = 55 %) (see notes 49g-l).

[17] Dp < 10 µm. Average and standard deviation of values corresponding to Polluted-Korea/Japan, Polluted-Japan, Volcano+Polluted, dust+Frontal, Dust+Korea, and Dust+Shanghai. Sulfate is sulfate aerosol (nss-SO4+NH4+H2O, RH = 55%) (see notes 49m-r).

Theoretical Method Notes table with further details about measurement methods

Theoretical Method Notes
[1a] Mass derived from size distributions from SMPS and APS (0.00931 < Dp < 20.535 um). Bsp computed with Mie theory at a wavelength at 530 nm. RH values not stated. Values are means. Mixed ('specific') method. (July 4 0100 LT - July 6 1900 LT 2002, Baltimore Supersite. Smoke transport from Canada)
[1b] Mass derived from size distributions from SMPS and APS (0.00931 < Dp < 20.535 um). Bsp computed with Mie theory at a wavelength at 530 nm. RH values not stated. Values are means. Mixed ('specific') method. (July 6 1905 LT - July 10 2200 LT 2002, Baltimore Supersite. Smoke transport from Canada)
[1c] Mass derived from size distributions from SMPS and APS (0.00931 < Dp < 20.535 um). Bsp computed with Mie theory at a wavelength at 530 nm. RH values not stated. Values are means. Mixed ('specific') method. (July 10 2205 LT - July 13 0055 LT 2002, Baltimore Supersite. Smoke transport from Canada)
[3] Bsp computed from ASASP-X OPC dry size distributions. Sulfate acidity varied. The accumulation mode was assumed to be all sulfate. Esp computed per mass of sulfate ion. Wavelength not stated. Mixed/apportioned method. (July 15 - August 22 1995, Great Smoky Mountains National Park, TN, SEAVS study).
[10] Mass size distributions (0.65 < Dp < 8.75 um). Values are means. Sulfate corresponds to excess sulfate ion. Mineral dust is traced by Al. Sea salt derived from sodium based on amounts in sea water. Externally mixed method. Wavelength of 670 nm. (Dec 1991, Jan 1994, Dec 1994-Feb 1995, Sal Island, Cape Verde).
[17] Computed using dry accumulation mode and coarse mode volume size distribution with Mie theory. Refractive indices from an alignment method. Size dependence of Esp reported. Wavelength of 530 nm. Mixed ('specific') method. (July-Oct 1999, Big Bend National Park, TX).
[19a] MOUDI size distributions at ambient humidity (0.32 < Dp < 10 um, RH = 73 %). Sulfate corresponds to nss-SO4 ion. Externally mixed method. (June 10 0800-1900 1992, Santa Maria, Azores archipelago, clean maritime air)
[19b] MOUDI size distributions at ambient humidity (0.32 < Dp < 10 um, RH = 95 %). Sulfate corresponds to nss-SO4. Externally mixed method. (June 13 2000-0700 1992, Santa Maria, Azores archipelago, drizzle, clean maritime air)
[19c] MOUDI size distributions at ambient humidity (0.32 < Dp < 10 um, RH = 81 %). Sulfate corresponds to nss-SO4. Externally mixed method. (June 19 2000-0700 1992, Santa Maria, Azores archipelago, continental polluted air)
[19d] MOUDI size distributions at ambient humidity (0.32 < Dp < 10 um, RH = 77 %). Sulfate corresponds to nss-SO4. Externally mixed method. (June 20 0800-1900 1992, Santa Maria, Azores archipelago, continental polluted air)
[19e] MOUDI size distributions at ambient humidity (0.32 < Dp < 10 um, RH = 69 %). Sulfate corresponds to nss-SO4. Externally mixed method. (Aug 3 1029-2146 1994, Christmas Island, Republic of Kiribati, low contributions from anthropogenic sources)
[22] MOUDI size distributions (0.056 < Dp < 18 um). Sulfate corresponds to accumulation mode NH4 + SO4 as bisulfate. Water soluble OC. Na + Cl (sea salt) associated with coarse mode. Coarse mode dust computed for Ca + CO3. Particle growth by Tang. Median values. RH not stated. Size dependence of Esp reported. Externally mixed method. (Oct - Nov 1997, Jan 1998, Waliguan Mountain, Qinghai Province, China)
[29a] DRUM sulfur size distributions for Dp < 2.5 um. Sulfur assumed to be dry ammonium sulfate. Esp computed for ammonium sulfate mass. Wavelength not stated. Externally mixed method. Size dependence of Esp observed. (Jan-Feb 1988, Hopi Point, Grand Canyon, AZ)
[29b] DRUM sulfur size distributions for Dp < 2.5 um. Sulfur assumed to be wet ammonium sulfate. Esp estimated for wet ammonium sulfate mass and wet bsp (ammonium sulfate + water) Wavelength not stated. Externally mixed method. Size dependence of Esp observed. (Jan-Feb 1988, Hopi Point, Grand Canyon, AZ)
[29c] DRUM sulfur size distributions for Dp < 2.5 um. Sulfur assumed to be ammonium sulfate. Enhanced Esp estimated for dry ammonium sulfate mass and wet bsp. Wavelength not stated. Externally mixed method. Size dependence of Esp observed. (Jan-Feb 1988, Hopi Point, Grand Canyon, AZ)
[29d] DRUM sulfur size distributions for Dp < 2.5 um. Sulfur assumed to be dry ammonium sulfate. Esp computed for ammonium sulfate mass. Wavelength not stated. Externally mixed method. Size dependence of Esp observed. (Summer 1992, Meadview, AZ)
[29e] DRUM sulfur size distributions for Dp < 2.5 um. Sulfur assumed to be wet ammonium sulfate. Esp estimated for wet ammonium sulfate mass and wet bsp (ammonium sulfate + water) Wavelength not stated. Externally mixed method. Size dependence of Esp observed. (Summer 1992, Meadview, AZ)
[29f] DRUM sulfur size distributions for Dp < 2.5 um. Sulfur assumed to be ammonium sulfate. Enhanced Esp estimated for dry ammonium sulfate mass and wet bsp. Wavelength not stated. Externally mixed method. Size dependence of Esp observed. (Summer 1992, Meadview, AZ)
[29g] DRUM sulfur size distributions for Dp < 2.5 um. Sulfur assumed to be dry ammonium sulfate. Esp computed for ammonium sulfate mass. Wavelength not stated. Externally mixed method. Size dependence of Esp observed. (Summer 1990, Shenandoah National Park, VA)

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[29h] DRUM sulfur size distributions for Dp < 2.5 um. Sulfur assumed to be wet ammonium sulfate. Esp estimated for wet ammonium sulfate mass and wet bsp (ammonium sulfate + water) Wavelength not stated. Externally mixed method. Size dependence of Esp observed. (Summer 1990, Shenandoah National Park, VA)

[29i] DRUM sulfur size distributions for Dp < 2.5 um. Sulfur assumed to be ammonium sulfate. Enhanced Esp estimated for dry ammonium sulfate mass and wet bsp. Wavelength not stated. Externally mixed method. Size dependence of Esp observed. (Summer 1990, Shenandoah National Park, VA)

[31a] Drum size distributions (PM2.5) for dry ammonium sulfate and calculated Bsp. Wavelength not stated. Externally mixed method. (July 15 - Aug 25, 1995, Great Smoky National Park, TN)

[31b] Drum size distributions (PM2.5) for wet ammonium sulfate and calculated wet Bsp, at ambient humidity. Wavelength not stated. Externally mixed method. (July 15 - Aug 25, 1995, Great Smoky National Park, TN).

[31c] Drum size distributions (PM2.5) for water enhanced ammonium sulfate at 75% humidity (dry ammonium sulfate mass and wet Bsp). Externally mixed method. Wavelength not stated. (July 15 - Aug 25, 1995, Great Smoky National Park, TN)

[32] MOUDI size distributions (0.18 < Dp < 18 um) of dry ammoniated sulfate mass. Exact form of sulfate not specified. Externally mixed method. Size dependence of Esp observed. (July-Oct 1999, Big Bend National Park, TX)

[33] DMA dry size distributions of accumulation mode. Mixed ('specific') method. (July-Sept 2002, Yosemite National Park, CA)

[34a] APS and SMPS size distributions (Dp < 15 um) for dust, assuming Dp < 0.6 is non-dust and the rest is dust. Mixed ('specific') method. (July 3- 29 1999, Izana, Tenerife, Canary Islands)

[37] DMA and OPC dry aligned size distributions (0.04 < Dp < 2 um) and retrieved refractive indices. Wavelength not stated. Mixed ('specific') method. (July-Sept 2004, Yosemite National Park, CA)

[43] DMA and APS number distributions, RH = 30 %. Sulfate corresponds to sulfate ion for Dp < 10 um. (April - May 1991, Cheeka Peak, WA). Mixed fine corresponds to residual mass (Dp < 1 um). Total corresponds to super micron (1 < Dp < 10 um) residual mass. Mixed/apportioned method. (1991 & 1992, PSI and MAGE samples).

[43b] DMA and APS number distribution, RH = 30 %. Sulfate corresponds to sulfate aerosol. Mixed/apportioned method (Feb-March 1992, PSI and MAGE samples, Pacific Ocean from 33 N to 12 S along 140 W)

[45a] Size distribution and mass data for Dp < 1 um. RH varies between 30-45 %. Sulfate corresponds to (nss-SO4+NH4+H20). Mixed Fine corresponds to Dp < 1 um and (sea salt + nss-so4).Sea salt corresponds to Dp < 1 um and Na+K+Mg+Ca+Cl+ss-SO4). Mixed/apportioned method (Nov-Dec 1995, 41 deg south to 54 south, 135 east to 160 east, for Marine air, short (<5 days) marine boundary layer residence time)

[45b] Size distribution and mass data for Dp < 1 um. RH varies between 30-45 %. Sulfate corresponds to (nss-SO4+NH4+H20). Mixed fine corresponds to Dp < 1 um and (sea salt + nss-so4). Sea salt corresponds to Dp < 1 um and (Na+K+Mg+Ca+Cl+ss-SO4). Mixed/apportioned method (Nov-Dec 1995, 41 deg south to 54 south, 135 east to 160 east, for Marine air, long (>= 5days) marine boundary layer residence time)

[45c] Size distribution and mass data for Dp < 1 um. RH varies between 30-45 %. Sulfate corresponds to (nss-SO4+NH4+H20). Mixed fine corresponds to Dp < 1 um and (sea salt + nss-so4). Sea salt corresponds to Dp < 1 um and (Na+K+Mg+Ca+Cl+ss-SO4). Mixed/apportioned method (Nov-Dec 1995, 41 deg south to 54 south, 135 east to 160 east, for Perturbed marine air)

[45d] Size distribution and mass data for Dp < 1 um. RH varies between 30-45 %. Sulfate corresponds to nss-SO4 ion. Mixed/apportioned method (Nov-Dec 1995, 41 deg south to 54 south, 135 east to 160 east, for Marine air, short (<5 days) marine boundary layer residence time)

[45e] Size distribution and mass data for Dp < 1 um. RH varies between 30-45 %. Sulfate corresponds to nss-SO4 ion. Mixed/apportioned method (Nov-Dec 1995,41 deg south to 54 south, 135 east to 160 east, for Marine air, long (>= 5days) marine boundary layer residence time)

[45f] Size distribution and mass data for Dp < 1 um. RH varies between 30-45 %. Sulfate corresponds to nss-SO4 ion. Mixed/apportioned method. (Nov-Dec 1995,41 deg south to 54 south, 135 east to 160 east, for Perturbed marine,)

[46a] Size distributions for Dp < 10 um, RH = 55 %. Sea salt, nss-SO4 ion, dust/trace elements, POM = 1.6* OC for North American air masses and POM = 2.1*OC for all other air masses. Reported means for North America, NH marine, dust, dust/biomass burning, biomass burning. Mixed/apportioned method. (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46b] Size distributions for Dp < 1.1 um, RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion, with Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion. Dust refers to dust or trace elements. POM = 1.6* OC for North American air masses and POM = 2.1*OC for all other air masses. Fine mixed aerosol for Dp < 1.1 um. Mean for North America. Mixed/apportioned method. (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46c] Size distributions for Dp < 1.1 um, RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion, with Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion. Dust refers to dust or trace elements. POM = 1.6* OC for North American air masses and POM = 2.1*OC for all other air masses. Fine mixed aerosol for Dp < 1.1 um. Mean for Northern Hemisphere marine. Mixed/apportioned method. (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

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[46d] Size distributions for Dp < 1.1 um, RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion, with Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion. Dust refers to dust or trace elements. POM = 1.6* OC for North American air masses and POM = 2.1*OC for all other air masses. Fine mixed aerosol for Dp < 1.1 um. Mean for African dust. Mixed/apportioned method. (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46f] Size distributions for Dp < 1.1 um, RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion, with Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion. Dust refers to dust or trace elements. POM = 1.6* OC for North American air masses and POM = 2.1*OC for all other air masses. Fine mixed aerosol for Dp < 1.1 um. Mean for biomass burning. Mixed/apportioned method (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46g] Size distributions for Dp < 1.1 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (includes Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water. Mean for North America. Mixed/apportioned method. (Jan 14 - Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46h] Size distributions for Dp < 1.1 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (includes Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water. Mean for Northern Hemisphere marine. Mixed/apportioned method. (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46i] Size distributions for Dp < 1.1 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (includes Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water. Mean for African dust. Mixed/apportioned method. (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46j] Size distributions for Dp < 1.1 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (includes Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water. Mean for African dust/biomass burning. Mixed/apportioned method. (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46k] Size distributions for Dp < 1.1 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (includes Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water. Mean for biomass burning. Mixed/apportioned method. (Jan 14 - Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46l] Size distributions for 1.1 < Dp < 10 um and RH = 55%. Sea salt includes NO3 and water. Dust refers to dust or trace elements. POM = 1.6* OC for North American air masses and POM = 2.1*OC for all other air masses. Mixed coarse aerosol for 1.1 < Dp < 10 um. Mean for North America. Mixed/apportioned method. (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46m] Size distributions for 1.1 < Dp < 10 um and RH = 55%. Sea salt includes NO3 and water. Dust refers to dust or trace elements. POM = 1.6* OC for North American air masses and POM = 2.1*OC for all other air masses. Mixed coarse aerosol for 1.1 < Dp < 10 um. Mean for Northern Hemisphere marine. Mixed/apportioned method. (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46n] Size distributions for 1.1 < Dp < 10 um and RH = 55%. Sea salt includes NO3 and water. Dust refers to dust or trace elements. POM = 1.6* OC for North American air masses and POM = 2.1*OC for all other air masses. Mixed coarse aerosol for 1.1 < Dp < 10 um. Mean for African dust. Mixed/apportioned method. (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46o] Size distributions for 1.1 < Dp < 10 um and RH = 55%. Sea salt includes NO3 and water. Dust refers to dust or trace elements. POM = 1.6* OC for North American air masses and POM = 2.1*OC for all other air masses. Mixed coarse aerosol for 1.1 < Dp < 10 um. Mean for African dust/biomass burning. Mixed/apportioned method. (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46p] Size distributions for 1.1 < Dp < 10 um and RH = 55%. Sea salt includes NO3 and water. Dust refers to dust or trace elements. POM = 1.6* OC for North American air masses and POM = 2.1*OC for all other air masses. Mixed coarse aerosol for 1.1 < Dp < 10 um. Mean for biomass burning. Mixed/apportioned method. (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[48a] Size distributions for Dp < 10 um and RH = 55 %. Sea salt, nss-SO4 ion, inorganic oxidized material (dust), POM =1.6*OC. Mean for entire experiment. Mixed/apportioned method. (Feb-March 1999, Arabian Sea, Bay of Bengal, Indian Ocean, north and south of the ITCZ)

[48b] Size distributions for Dp < 1.1 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion. Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion. Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Fine mixed aerosol corresponds to Dp < 1.1 um. Mean for SH Atlantic. Mixed/apportioned method. (Feb-March 1999)

[48c] Size distributions for Dp < 1.1 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion. Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion. Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Fine mixed aerosol corresponds to Dp < 1.1 um. Mean for SH Indian Ocean. Mixed/apportioned method. (Feb-March 1999)

[48d] Size distributions for Dp < 1.1 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion. Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion. Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Fine mixed aerosol corresponds to Dp < 1.1 um. Mean for NH Indian Ocean. Mixed/apportioned method. (Feb-March 1999)

[48e] Size distributions for Dp < 1.1 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion. Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion. Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Fine mixed aerosol corresponds to Dp < 1.1 um. Mean for East Indian Subcontinent. Mixed/apportioned method. (Feb-March 1999)

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[48f] Size distributions for Dp < 1.1 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion. Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion. Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Fine mixed aerosol corresponds to Dp < 1.1 um. Mean for Indian Subcontinent. Mixed/apportioned method. (Feb-March 1999)

[48h] Size distributions for Dp < 1.1 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion. Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion. Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Fine mixed aerosol corresponds to Dp < 1.1 um. Mean for Arabia-Indian subcontinent. Mixed/apportioned method. (Feb-March 1999)

[48i] Size distributions for Dp < 1.1 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion. Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion. Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Fine mixed aerosol corresponds to Dp < 1.1 um. Mean for Arabian sea, coastal India. Mixed/apportioned method. (Feb-March 1999)

[48j] Size distributions for Dp < 1.1 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Mean for SH Atlantic. Mixed/apportioned method. (Feb-March 1999)

[48k] Size distributions for Dp < 1.1 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Mean for SH Indian Ocean. Mixed/apportioned method. (Feb-March 1999)

[48l] Size distributions for Dp < 1.1 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Mean for NH Indian Ocean. Mixed/apportioned method. (Feb-March 1999)

[48m] Size distributions for Dp < 1.1 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Mean for East Indian subcontinent. Mixed/apportioned method. (Feb-March 1999)

[48n] Size distributions for Dp < 1.1 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Mean for Indian subcontinent Mixed/apportioned method. (Feb-March 1999)

[48o] Size distributions for Dp < 1.1 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Mean for Arabia Mixed/apportioned method. (Feb-March 1999)

[48p] Size distributions for Dp < 1.1 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Mean for Arabia-Indian subcontinent Mixed/apportioned method. (Feb-March 1999)

[48q] Size distributions for Dp < 1.1 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Mean for Arabian Sea, coastal India Mixed/apportioned method. (Feb-March 1999)

[48r] Size distributions for 1.1 < Dp < 10 um, RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion (Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion). Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Mixed coarse aerosol corresponds to 1.1 < Dp < 10 um. Mean for SH Atlantic Mixed/apportioned method. (Feb-March 1999)

[48s] Size distributions for 1.1 < Dp < 10 um, RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion (Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion). Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Mixed coarse aerosol corresponds to 1.1 < Dp < 10 um. Mean for SH Indian Ocean Mixed/apportioned method. (Feb-March 1999)

[48t] Size distributions for 1.1 < Dp < 10 um, RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion (Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion). Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Mixed coarse aerosol corresponds to 1.1 < Dp < 10 um. Mean for NH Indian Ocean Mixed/apportioned method. (Feb-March 1999)

[48u] Size distributions for 1.1 < Dp < 10 um, RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion (Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion). Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Mixed coarse aerosol corresponds to 1.1 < Dp < 10 um. Mean for East Indian Subcontinent Mixed/apportioned method. (Feb-March 1999)

[48v] Size distributions for 1.1 < Dp < 10 um, RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion (Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion). Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Mixed coarse aerosol corresponds to 1.1 < Dp < 10 um. Mean for Indian Subcontinent Mixed/apportioned method. (Feb-March 1999)

[48w] Size distributions for 1.1 < Dp < 10 um, RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion (Bsp due to nss-SO4, NH4 and water, and sulfate mass due to nss-SO4 ion). Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Mixed coarse aerosol corresponds to 1.1 < Dp < 10 um. Mean for Arabia Mixed/apportioned method. (Feb-March 1999)

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[48x] Size distributions for 1.1 < Dp < 10 um, RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion (Bsp due to nss- SO4, NH4 and water, and sulfate mass due to nss-SO4 ion). Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Esp for BC and nss K includes associated SO4 and NO3. Mixed coarse aerosol corresponds to 1.1 < Dp < 10. Mean for Arabia-Indian subcontinent Mixed/apportioned method. (Feb-March 1999)

[48y] Size distributions for 1.1 < Dp < 10 um, RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 ion (Bsp due to nss- SO4, NH4 and water, and sulfate mass due to nss-SO4 ion). Dust refers to inorganic oxidized material plus residual. POM = 1.6*OC. Esp for BC and nss K includes associated SO4 and NO3. Mixed coarse aerosol corresponds to 1.1 < Dp < 10. Mean for Arabian sea, coastal India Mixed/apportioned method. (Feb-March 1999)

[48z] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water) Mean for East Indian subcontinent. Mixed/apportioned method. (Feb-March 1999)

[48aa] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Mean for Indian subcontinent Mixed/apportioned method. (Feb-March 1999)

[48bb] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water) Mean for Arabia Mixed/apportioned method. (Feb-March 1999)

[48cc] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Mean for Arabia-Indian subcontinent Mixed/apportioned method. (Feb-March 1999)

[49a] Size distributions for Dp < 1.1 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed fine aerosol for Dp < 1.1 um. Mean for Polluted-Korea/Japan. Mixed/apportioned method. (mid-March to mid-April 2001)

[49b] Size distributions for Dp < 1.1 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere.Esp for EC and nss K, includes associated SO4 and NO3. Mixed fine aerosol for Dp < 1.1 um. Mean for Polluted-Japan. Mixed/apportioned method. (mid-March to mid-April 2001)

[49c] Size distributions for Dp < 1.1 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere.Esp for EC and nss K, includes associated SO4 and NO3. Mixed fine aerosol for Dp < 1.1 um. Mean for Volcano+Polluted. Mixed/apportioned method. (mid-March to mid-April 2001)

[49d] Size distributions for Dp < 1.1 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed fine aerosol for Dp < 1.1 um. Mean for dust + Frontal. Mixed/apportioned method. (mid-March to mid-April 2001)

[49e] Size distributions for Dp < 1.1 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed fine aerosol for Dp < 1.1 um. Mean for Dust + Korea .Mixed/apportioned method. (mid-March to mid-April 2001)

[49f] Size distributions for Dp < 1.1 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed fine aerosol for Dp < 1.1 um. Mean for Dust + Shanghai. Mixed/apportioned method. (mid-March to mid-April 2001)

[49g] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed coarse aerosol for 1.1 < Dp < 10 um. Mean for Polluted-Korea/Japan Mixed/apportioned method. (mid-March to mid-April 2001)

[49h] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed coarse aerosol for 1.1 < Dp < 10 um. Mean for Polluted-Japan Mixed/apportioned method. (mid-March to mid-April 2001)

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[49i] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed coarse aerosol for 1.1 < Dp < 10 um. Mean for Volcano+Polluted Mixed/apportioned method. (mid-March to mid-April 2001)

[49j] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed coarse aerosol for 1.1 < Dp < 10 um. Mean for dust + Frontal.Mixed/apportioned method. (mid-March to mid-April 2001)

[49k] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed coarse aerosol for 1.1 < Dp < 10 um. Mean for Dust + Korea. Mixed/apportioned method. (mid-March to mid-April 2001)

[49l] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed coarse aerosol for 1.1 < Dp < 10 um. Mean for Dust + Shanghai Mixed/apportioned method. (mid-March to mid-April 2001)

[49m] Size distributions for Dp < 10 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed total aerosol for Dp < 10 um. Mean for Polluted-Korea/Japan. Mixed/apportioned method. (mid-March to mid-April 2001)

[49n] Size distributions for Dp < 10 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed total aerosol for Dp < 10 um. Mean for Polluted-Japan. Mixed/apportioned method. (mid-March to mid-April 2001)

[49o] Size distributions for Dp < 10 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed total aerosol for Dp < 10 um. Mean for Volcano+Polluted. Mixed/apportioned method. (mid-March to mid-April 2001)

[49p] Size distributions for Dp < 10 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed total aerosol for Dp < 10 um. Mean for dust + Frontal. Mixed/apportioned method. (mid-March to mid-April 2001)

[49q] Size distributions for Dp < 10 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed total aerosol for Dp < 10 um. Mean for Dust + Korea. Mixed/apportioned method. (mid-March to mid-April 2001)

[49r] Size distributions for Dp < 10 um and RH = 55 %. Sea salt includes NO3 and water. Sulfate corresponds to nss-SO4 aerosol (Bsp due to nss-SO4 ion, NH4, and water, and sulfate mass due to nss-SO4, NH4 and water). Dust refers to inorganic oxidized material. POM = 2.1*OC in marine regions and POM = 1.6*OC elsewhere. Esp for EC and nss K, includes associated SO4 and NO3. Mixed total aerosol for Dp < 10 um. Mean for Dust + Shanghai. Mixed/apportioned method. (mid-March to mid-April 2001)

Table 3 Summary of a literature survey of mass scattering efficiencies using the **measurement method.** The first column corresponds to the reference number and entry in the associated notes table.

						Measurement Method Mass Scattering Efficiencies ($m^2\ g^{-1}$)*	
Note	Fine Mode	Coarse Mode	Total	Sulfate	Dust**	Location/ Characteristics/ Study	Time
1[1]			1.2±0.9			Baltimore MD Canadian Smoke	Jul 4,6,10 2002
2[2]			1.84±0.18			Yulin China Polluted periods (ACE-Asia)	Apr 2002
2[3]			1.03±0.13			Yulin China Dust periods (ACE-Asia)	Apr 2002
6[4]	3.0±0.6		2.3			Beijing China	Jun 1999
7[5]	3.9±0.5					Atlanta GA (Supersite)	Jul–Sep 1999
8a	1.65					Brisbane Australia	Apr-Jun 1999
9a	7.6					Fort Meade MD (MARCH-Atlantic study)	Jul 1999
11[6]	2.1±0.2					Phoenix AZ	Winter 1989-1990
11[7]	1.720±0.014					Meadview AZ (MOHAVE study)	Summer 1992
11[8]	1.89±0.04					Buffalo Pass CO (Mt. Zirkel Visibility Study)	Summer/Fall 1995
11[9]	2.2±0.4					Brighton CO (NFRAQS Study)	Winter 1997
11[10]	2.0±0.5					Welby CO (NFRAQS Study)	Winter 1997
11[11]	3.45±0.07					Bakersfield CA (IMS95 Study)	Winter 1995
11[12]	5.1±0.4					Mexico City Mexico	Winter 1997
12[13]	3.7, 4.1, 5.2					Maldives (INDOEX) ($b_{sp} < 25$ Mm-1)	Feb–Mar 1999
12[14]	3.4, 2.2, 3.9, 4.7					Maldives (INDOEX) ($25 < b_{sp} < 55$ Mm-1)	Feb–Mar 1999
12[15]	3.5, 2.9, 4.1, 4.4					Maldives (INDOEX) ($b_{sp} > 55$ Mm-1)	Feb–Mar 1999
12[16]	3.5, 3.1, 3.8, 4.5					Maldives Bay of Bengal trajectory (INDOEX study)	Feb–Mar 1999
12[17]	2.7, 3.9, 4.3					Maldives Arabian trajectory (INDOEX study)	Feb–Mar 1999
18a[18]				2.02 (1.47)		Big Bend National Park, TX (BRAVO study)	Jul-Oct 1999
21a	4.1					Bondville IL	Jan-Dec 1995
23a					0.77	Barbados	Apr-May 1994
27a	4.19					Mt. Rainier National Park WA (PREVENT study)	Summer 1990
27b	4.26					North Cascades National Park WA (PREVENT study)	Summer 1990

Note	Fine Mode	Coarse Mode	Total	Sulfate	Dust[**]	Location/ Characteristics/ Study	Time
34a[19]				3.70±0.14	0.52	Tenerife Canary Islands	Jul 1995
35a[20]	3.7					Dallas Fort-Worth TX (DFWWHP study)	Feb 23, 1995
35b[21]	3.1					Dallas Fort-Worth TX (DFWWHP study)	Feb 25, 1995
35c[22]	3.8					Dallas Fort-Worth TX (DFWWHP study)	Dec 30, 1995
42a	6					New England and Mid-Atlantic Smoke aerosol	Jul 2002
47h	2.5					Barrow AK	1997-2000
50a	3.67					San Joaquin Valley CA (IMS95 Study)	Dec 1995–Jan 1996
54a	1.91					Buffalo Pass CO (Mt. Zirkel Visibility Study)	Aug, Sep, Oct 1995
56a[23]	2.37	0.27				Spirit Mountain NV (SCENES program)	Apr-Sep 1989
56c[23]	2.53	0.28				Meadview AZ (SCENES program)	Apr-Sep 1989
56d[24]	2.5	0.54				Meadview AZ (SCENES program)	Apr-Sep 1989,
56e[24]	2.4	0.52				Spirit Mountain NV (SCENES program)	Apr-Sept1989
57a	4					Linan China	Nov 1999

Footnotes for Measurement Method

[*] All values reported for a wavelength of 550 nm unless otherwise stated in the note table. Size ranges, relative humidity (when reported) and instruments are stated in the Measurement note table. Value in parentheses corresponds to efficiencies converted to dry ammonium sulfate. Dust values correspond to total size distribution.

[**]Dust efficiencies correspond to total aerosol modes.

[1] Average and standard deviation of three time periods (see notes 1a, 1b, and 1c). Mass derived from size distribution volume concentration and density.

[2] Average and standard deviation of three polluted periods (see notes 2a, 2b, and 2c)

[3] Average and standard deviation of three dust periods (see notes 2d, 2e, and 2f in note table)

[4] Average and standard deviation of PM1.8 from MOUDI and PM2.5 from filter mass (see notes 6a and 6c)

[5] Average and standard deviation of PM2.5 TEOM, PM2.5 filter and PM1.8 MOUDI estimates (see notes 7a, 7b and 7c)

[6] Average and standard deviation of unweighted and effective-variance weighted estimates (see notes 11a and 11b).

[7] Average and standard deviation of unweighted and effective-variance weighted estimates (see notes 11c and 11d).

[8] Average and standard deviation of unweighted and effective-variance weighted estimates (see notes 11e and 11f).

[9] Average and standard deviation of unweighted and effective-variance weighted estimates (see notes 11g and 11h).

[10] Average and standard deviation of unweighted and effective-variance weighted estimates (see notes 11i and 11j).

[11] Average and standard deviation of unweighted and effective-variance weighted estimates (see notes 11k and 11l).

[12] Average and standard deviation of unweighted and effective-variance weighted estimates (see notes 11m and 11n).

[13] Values correspond to estimates from gravimetric mass from Caltech and R/V Ronald Brown and the sum of chemically analyzed mass from R/V Ronald Brown, respectively (see notes 12a, 12b and 12c).

[14] Values correspond to estimates from gravimetric mass from Caltech, sum of chemically analyzed mass from U. of Miami, gravimetric mass from R/V Ronald Brown and the sum of chemically analyzed mass from R/V Ronald Brown, respectively (see notes 12d, 12e, 12f and 12g).

[15] Values correspond to estimates from gravimetric mass from Caltech, sum of chemically analyzed mass from U. of Miami, gravimetric mass from R/V Ronald Brown and the sum of chemically analyzed mass from R/V Ronald Brown, respectively (see notes 12h, 12i, 12j and 12k).

[16] Values correspond to estimates from gravimetric mass from Caltech, sum of chemically analyzed mass from U. of Miami, gravimetric mass from R/V Ronald Brown and the sum of chemically analyzed mass from R/V Ronald Brown, respectively (see notes 12l, 12m, 12n and 12o).

[17] Values correspond to estimates from sum of chemically analyzed mass from U. of Miami, gravimetric mass from R/V Ronald Brown and the sum of chemically analyzed mass from R/V Ronald Brown, respectively (see notes 12p, 12q, and 12r).

[18] Converting this value to ammonium sulfate mass would be 1.47 $m^2\ g^{-1}$

[19] Average and standard deviation of values from a dusty and non-dusty period (see notes 34b and 34c).

[20] Ratio of bsp and dry+water mass at RH = 73 % (see notes 35a)

[21] Ratio of bsp and dry+water mass at RH = 44 % (see notes 35b)

[22] Ratio of bsp and dry+water mass at RH = 71 % (see notes 35c)

[23] Computed by using mass and bsp values reported in the manuscript

[24] As reported in the manuscript.

Measurement Method Notes table with further details about measurement methods

Measurement Method Notes
[1a] Mass derived from size distributions from SMPS and APS (0.00931 < Dp < 20.535 µm). Bsp measured with Radiance Research M903 integrating nephelometer at a wavelength at 530 nm. RH values not stated. Values are means. (July 4 0100 LT - July 6 1900 LT 2002, Baltimore Supersite. Smoke transport from Canada)
[1b] Mass derived from size distributions from SMPS and APS (0.00931 < Dp < 20.535 µm). Bsp measured with Radiance Research M903 integrating nephelometer at a wavelength at 530 nm. RH values not stated. Values are means. July 6 1905 LT - July 10 2200 LT 2002, Baltimore Supersite. Smoke transport from Canada)
[1c] Mass derived from size distributions from SMPS and APS (0.00931 < Dp < 20.535 µm). Bsp measured with Radiance Research M903 integrating nephelometer at a wavelength at 530 nm. RH values not stated. Values are means. (July 10 2205 LT - July 13 0055 LT 2002, Baltimore Supersite. Smoke transport from Canada)
[2a] Esp derived from slope of TEOM PM9 mass and corrected Bsp measured with a TSI 3563 nephelometer at a wavelength of 450 nm. RH values not stated. (April, 2002, Zhenbeitai, Yulin, China, polluted period 3, local origin)
[2b] Esp derived from slope of TEOM PM9 mass and corrected Bsp measured with a TSI 3563 nephelometer at a wavelength of 450 nm. RH values not stated. (April, 2002, Zhenbeitai, Yulin, China polluted period 4, local origin,)
[2c] Esp derived from slope of TEOM PM9 mass and corrected Bsp measured with a TSI 3563 nephelometer at a wavelength of 450 nm. RH values not stated. (April, 2002, Zhenbeitai, Yulin, China, polluted period 5, local origin)
[2d] Esp derived from slope of TEOM PM9 mass and corrected Bsp measured with a TSI 3563 nephelometer at a wavelength of 450 nm. RH values not stated. (April, 2002, Zhenbeitai, Yulin, China, dust period 3, local origin)
[2e] Esp derived from slope of TEOM PM9 mass and corrected Bsp measured with a TSI 3563 nephelometer at a wavelength of 450 nm. RH values not stated. (April, 2002, Zhenbeitai, Yulin, China, dust period 4, transported + local origin)
[2f] Esp derived from slope of TEOM PM9 mass and corrected Bsp measured with a TSI 3563 nephelometer at a wavelength of 450 nm. RH values not stated. (April, 2002, Zhenbeitai, Yulin, China, dust period 5, local origin)
[6a] Mixed fine corresponds to mass from MOUDI size distributions up to PM1.8 and Bsp measured with a Radiance Research nephelometer at a wavelength at 530 nm and RH < 40 %. (Jun 11 - Jun 15, 1999, Peking University, Beijing, China)
[6b] Mass from TEOM PM10 and Bsp measured with a Radiance Research nephelometer at a wavelength at 530 nm and RH < 40 %. (Jun 10 22:00 -June 16 11:00 1999, Peking University, Beijing, China)
[6c] Mass from PM2.5 filter and Bsp measured with a Radiance Research nephelometer at a wavelength at 530 nm and RH < 40 %. (Jun 10 22:00 -June 16 11:00 1999, Peking University, Beijing, China)
[7a] TEOM PM2.5 mass and Bsp measured with a Radiance Research M903 nephelometer at a wavelength of 530 nm. Average RH value of 48 %. (July 30 - Sept 3 1999, Atlanta, GA)
[7b] PM2.5 filter mass and Bsp measured with a Radiance Research M903 nephelometer at a wavelength of 530 nm (July 30 - Sept 3 1999, Atlanta)
[7c] MOUDI mass (includes sum of all stages and after-filter, 0.056 < Dp < 1.78 µm). Eap based on measured EC size distribution and measured Bap with a PSAP at a wavelength of 550 nm. (July 30 - Sept 3 1999, Atlanta, GA)
[7d] R&P 5400 EC data and Bap measured with a PSAP at a wavelength of 550 nm. (July 30 - Sept 3 1999, Atlanta, GA)
[8a] PM2.5 Esp mass and dry Bsp from a nephelometer at a wavelength of 530 nm for all PM2.5 aerosols. (April-June 1999, Eagle Farm, Brisbane, Australia)
[9a] PM2.5 mass and Bsp from a Belfort Model 6620 forward scatter visibility meter at a wavelength of 515 nm for hydrated aerosol. Ambient water mass estimated through ISORROPIA. (July 1999, 2000, Fort Meade, MD)
[11a] PM2.5 mass and Bsp from MRI model 1550 nephelometer at a wavelength of 450 nm. Unweighted regression. (Winter 1989-1990, Phoenix, AZ, 6 hour sampling durations)
[11b] PM2.5 mass and Bsp from MRI model 1550 nephelometer at a wavelength of 450 nm. Effective-variance-weighted regression. (winter 1989-1990, Phoenix, AZ, 6 hour sampling durations)

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[11c] PM2.5 mass and Bsp from MRI model 1560 nephelometer at a wavelength at 525 nm and RH < 60 %. Unweighted regression. (Summer 1992, Meadview, AZ, 12 hour samples)
[11d] PM2.5 mass and Bsp from MRI model 1560 nephelometer at a wavelength at 525 nm and RH < 60 %. Effective variance weighted regression. (Summer 1992, Meadview, AZ, 12 hour samples)
[11e] PM2.5 mass and Bsp from TSI nephelometer at RH < 60 %. Unweighted regression. (Summer/fall 1995, Buffalo pass, CO, 6 hour samples)
[11f] PM2.5 mass and Bsp from TSI nephelometer at RH < 60 %. Effective variance weighted regression. (Summer/fall 1995, Buffalo pass, CO, 6 hour samples)
[11g] PM2.5 mass and Bsp from ambient-temperature Optec NGN-2 nephelometer. Unweighted regression. (Winter 1997, Brighton, CO,12 hour sampling durations)
[11h] PM2.5 mass and Bsp from ambient-temperature Optec NGN-2 nephelometer. Effective variance weighted regression.(Winter 1997, Brighton, CO,12 hour sampling durations)
[11i] PM2.5 mass and Bsp from ambient-temperature Optec NGN-2 nephelometer. Unweighted regression of PM2.5 and Bsp. (Winter 1997, Welby, CO, 12 hour sampling durations)
[11j] PM2.5 mass and Bsp from ambient-temperature Optec NGN-2 nephelometer. Effective variance weighted regression. (Winter 1997, Welby, CO, 12 hour sampling durations)
[11k] PM2.5 mass and Bsp from ambient-temperature Optec NGN-2 nephelometer. Unweighted regression. (Winter 1995, Bakersfield, CA, 3 hour samples)
[11l] PM2.5 mass and Bsp from ambient-temperature Optec NGN-2 nephelometer. Effective variance weighted regression. (Winter 1995, Bakersfield, CA,3 hour samples)
[11m] PM2.5 mass and Bsp from ambient-temperature Optec NGN-2 nephelometer. Unweighted regression. (Winter 1997, Mexico City, Mexico, urban site, 6 hour samples)
[11n] PM2.5 mass and Bsp from ambient-temperature Optec NGN-2 nephelometer. Effective variance weighted regression (Winter 1997, Mexico City, Mexico, urban site, 6 hour samples)
[12a] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. Caltech data. Ratio of Bsp and gravimetric mass. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, for low Bsp regime (Bsp < 25 Mm-1))
[12b] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. Ronald Brown R/V data. Ratio of Bsp and gravimetric mass. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, for low Bsp regime (Bsp < 25 Mm-1))
[12c] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. Ronald Brown R/V data. Ratio of Bsp and the sum of chemically analyzed mass. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, for low Bsp regime (Bsp < 25 Mm-1))
[12d] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. Caltech data.Esp is ratio of Bsp and gravimetric mass. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, medium Bsp regime (25 < Bsp < 55 Mm-1))
[12e] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. U. Miami data. Esp is ratio of Bsp and sum of chemically analzyed mass. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, medium Bsp regime (25 < Bsp < 55 Mm-1))
[12f] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. Ronald Brown R/V data. Esp is ratio of Bsp and gravimetric mass. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, medium Bsp regime (25 < Bsp < 55 Mm-1))
[12g] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. Ronald Brown R/V data. Esp is ratio of Bsp and sum of chemically analyzed mass. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, medium Bsp regime (25 < Bsp < 55 Mm-1))
[12h] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. Caltech data. Esp is ratio of Bsp and gravimetric mass.(Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, high Bsp regime (Bsp > 55 Mm-1))
[12i] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. U. Miami data. Esp is ratio of Bsp and sum of chemically analzyed mass.(Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, high Bsp regime (Bsp > 55 Mm-1))
[12j] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. Ronald Brown R/V data. Esp is ratio of Bsp and gravimetric mass.(Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, high Bsp regime (Bsp > 55 Mm-1))
[12k] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. Ronald Brown R/V data. Esp is ratio of Bsp and chemically analyzed mass.(Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, high Bsp regime (Bsp > 55 Mm-1))
[12l] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. Caltech data. Esp is ratio of Bsp and gravimetric mass. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, Bay of Bengal Trajectory)

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[12m] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. U. of Miami data. Esp is ratio of Bsp and sum of chemically analyzed mass. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, Bay of Bengal Trajectory)

[12n] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. Ronald Brown R/V data. Esp is ratio of Bsp and gravimetric mass. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, Bay of Bengal Trajectory)

[12o] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. Ronald Brown R/V data. Esp is ratio of Bsp and sum of chemically analyzed mass. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, Bay of Bengal Trajectory)

[12p] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. U. of Miami data. Esp is the ratio of Bsp and sum of chemically analyzed mass. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, Arabian Sea Trajectory)

[12q] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. Ronald Brown R/V data. Esp is the ratio of Bsp and gravimetric mass.(Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, Arabian Sea Trajectory)

[12r] Bsp is measured with a TSI 3563 nephelometer at RH = 33 % and Dp < 1 µm. Bap is measured with a PSAP. Ronald Brown R/V data. Esp is the ratio of Bsp and sum of chemically analyzed mass (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, Arabian Sea Trajectory)

[18a] Computed from SO4 measurements and bsp measurements with a NGN-2 Optec nephelometer at a wavelength at 530 nm, for RH < 90 %. Corresponds to RH = 0% from curve fit to Esp as a function of RH, for NH4/SO4 molar ratio of 1.56 and mass as sulfate ion. (July-Oct 1999, Big Bend National Park, TX)

[21a] Gravimetric mass for Dp < 1 µm and RH < 40 %, and from bsp measured with an integrating nephelometer (Jan-Dec 1995, Bondville, IL)

[23a] Bsp measured with Radiance Research M903 nephelometer at a wavelength of 530 nm, RH < 40% and Dp < 10 µm, corrected for truncation. (April 4 - May 3, 1994, Barbados)

[27a] PM2.5 mass and Bsp measured with integrating nephelometers run at near ambient conditions. Esp computed JLH. Wavelength not stated. Eap is the ratio of Babs by LIPM and LAC mass. (summer 1990, Tahoma Woods, Mount Rainier National Park, WA)

[27b] PM2.5 mass and Bsp measured with integrating nephelometers run at near ambient conditions. Esp computed JLH. Wavelength not stated. Eap is the ratio of Babs by LIPM and LAC mass. (summer 1990, Marblemount, North Cascades National Park, WA)

[34a] Computed Esp total mass and total Bsp during non-dusty period and assumed the relationship held during dusty period. Subtracted non-dust scattering from total Bsp during dusty period to get dust scattering. Bsp from a TSI 3563 nephelometer, corrected for truncation. (July 3 - 29 1995, Izana, Tenerife, Canary Islands)

[34b] Measured SO4 data as ammonium sulfate and Bsp from TSI 3563 nephelometer during non-dusty periods. Bsp attributed to sulfate was determined by subtracting off dust-related Bsp and assuming everything else is sulfate. RH not stated. (July 3 - 29 1999, Izana, Tenerife, Canary Islands)

[34c] Measured SO4 data as ammonium sulfate and Bsp from TSI 3563 nephelometer during dusty periods. Bsp attributed to sulfate was determined by subtracting off dust-related Bsp and assuming everything else is sulfate. RH not stated. (July 3 - 29 1999, Izana, Tenerife, Canary Islands)

[35a] Mass is estimated from dry size distributions with water from SCAPE. Bsp from ambient RH Optec NGN-2 nephelometer. RH = 73 %. Wavelength not stated (Feb 23 10:00-11:00 1995, Dallas-Fort Worth. Estimated for 1 hour of data)

[35b] Mass is estimated from dry size distributions with water from SCAPE. Bsp from Optec NGN-2 nephelometer. RH = 44 %. Wavelength not stated (Feb 25 10:00-11:00 1995, Dallas-Fort Worth. Estimated for 1 hour of data.)

[35c] Mass is estimated from dry size distributions with water from SCAPE. Bsp from Optec NGN-2 nephelometer. RH = 71 %. Wavelength not stated.(Dec 30 10:00-11:00 1994, Dallas-Fort Worth. Estimated for 1 hour of data.)

[42a] Fine mass and ambient Bsp measured with an Optec NGN3 nephelometer. POM = 1.8*OC. Stated as smoke scattering to mass ratio. (July 2002, New England and Mid-Atlantic States, smoke conditions)

[50a] Heated Belfort-MRI 1550B nephelometer at a wavelength of 475 nm and PM2.5 mass regression for RH < 60 %, (Dec 9 1995 - Jan 6 1996, Bakersfield Van Horn School, San Joaquin Valley, CA)

[54a] Linear regression of PM2.5 mass and Bsp with TSI 3563 nephelometer at a RH of 31 %. (Aug 3 - Sept 2, 1995 and Sept 15 - Oct 15 1995, Buffalo Pass, Mt Zirkel Wilderness Area, CO, average morning (0600-1200 MST) and afternoon (1200-1800 MST))

[56a] PM2.5 gravimetric mass and Bsp measured with a MRI 1597 integrating nephelometer at a wavelength of 525 nm. Eap is for a ratio of Babs from LIPM and PM2.5 aerosol. Coarse Esp is for 2.5 < Dp < 15 µm gravimetric mass. Ratio computed by JLH. (April-Sept 1989, Spirit Mountain, Nevada)

[56b] Eap for coarse (2.5 < Dp < 15 µm) gravimetric mass and Babs from LIPM. Ratio computed by JLH. (April-Sept 1989, Spirit Mountain, Nevada

[56c] PM2.5 gravimetric mass and Bsp measured with a MRI 1597 integrating nephelometer at a wavelength of 525 nm. Coarse mode corresponds to 2.5 < Dp < 15 µm gravimetric mass. Ratio computed by JLH. (April-Sept 1989, Meadview, AZ)

[56d] Mean PM2.5 dust + haze mass and Bsp measured with a MRI 1597 integrating nephelometer at a wavelength of 525 nm. Coarse mode corresponds to 2.5 < Dp < 15 µm. (April-Sept 1989, Meadview, AZ)

[56e] Mean PM2.5 dust + haze mass and Bsp measured with a MRI 1597 integrating nephelometer at a wavelength of 525 nm. Coarse mode corresponds to 2.5 < Dp < 15 μm (April-Sept 1989, Spirit Mountain, NV)

[57a] PM2.5 mass and Bsp measured with Radiance Research nephelometer at 530 nm for RH < 40 %. Bap measured with a PSAP at 565 nm. (Oct 28-Nov 20 1999, Linan, China)

Table 4. Summary of a literature survey of mass scattering efficiencies using the **multi-linear regression (MLR)** method. The first column corresponds to the reference number and entry in the associated notes table. Entries correspond to the fine mode unless otherwise stated in the column heading, or noted with superscripts.

Multi-Linear Regression Method Mass Scattering Efficiency ($m^2 g^{-1}$)*									
Notes	**Fine Mode**	**Coarse Mode**	**Sulfate**	**POM**	**Nitrate**	**Dust**	**Sea Salt**	**Location/ Study**	**Time**
4[1]	5.8	0.5	5.6 *4.1*[†]			0.71[♦]		Sde Boker Israel (ARACHNE study)	Dec 1995– Oct 1997
8[2]			*10.9*			2.73		Brisbane Australia	Apr-Jun 1999
11[3]	2.5±0.6	0.62±0.16						Tucson AZ	Winter 1989-1990
11[4]	1.5±0.4	0.8±0.3						Welby CO (NFRAQS study)	Summer 1996
11[5]	3.0±0.2	0.275±0.007						Welby CO (NFRAQS study)	Winter 1996
14[6]		0.07	*2.08*	1.05 *0.82*	1.77	2.06		Canyonlands National Park UT	1990-1991
15[7]				0.9, 3.11	3.44			Salt Lake City UT	Jan-Feb 2001
16[8]	3		7.4 *3.4*[†]					Sde Boker Israel (ARACHNE study)	Jun-Jul 1996
20	3.669	0.121						Sde Boker Israel (ARACHNE study)	Feb-Mar 1997
21[9]			4.57 *4.0*[†]	4.11				Bondville IL	Jan-Dec 1995
25[10]			*3.2±0.3*	3.10±0.10 *2.07 ± 0.07*	3.47±0.12	0.7±0.6		Meadview AZ (MOHAVE study)	Summer 1992
25[11]			*2.6±0.3*	2.28±1.11 *1.5±0.7*	6.0 ± 1.7	5±2		Meadview AZ (MOHAVE study	Winter 1992
25[12]			*8±3*	2.6±0.9 *1.7±0.6*	2.4 ± 0.9	4±3		Phoenix AZ	Winter 1989-1990
25[13]			7.3±0.3 *3.05*[†]	12±8 *8±5*		1.8±0.9		Uniontown PA	Summer 1990
26	5.2	0.34						Sde Boker Israel	1995– Feb 1997
30			*2.2*	1.8 *1.4*	2.2	0.79		Grand Canyon National Park AZ	Jul-Aug 1998

Notes	Fine Mode	Coarse Mode	Sulfate	POM	Nitrate	Dust	Sea Salt	Location/Study	Time
36			6.3 *4.6*[†]				2.9[‡]	Tenerife Canary Islands	Jul 1995
39			8.3 *6.0*[†]					Rural Great Hungarian Plain	Oct 1994– Mar 1995
43[14]	4.3	0.6	3.6 *2.6*[†,♦]					Pacific Ocean and Cheeka Peak WA (PSI91 and MAGE92 Studies)	1991 & 1992
44[15]			4.5 ± 0.9 *3.2*[†,♦]				4.95 ± 0.07, 0.90 ± 0.3[‡]	Central Pacific Ocean (RITS 93 and RITS 94)	1993 & 1994
46[16]			5.7 *2.4*[†,♦]	2.7		0.9[♦]	2.2[♦]	Norfolk VA to Cape Town, South Africa, (Aerosols99)	Jan-Feb 1999
47[17]	0.82		5.3 *3.9*[†]				2.2	Barrow, AK	1997-2000
48[18]			2[♦] *0.83*[†,♦]	1.6[♦] *1.4*[♦]		0.51[♦]	1.7[♦]	Indian Ocean (INDOEX)	Feb-Mar 1999
50[19]	3.00±0.14		3.9±0.3 *1.5*[†]					San Joaquin Valley CA (IMS95)	Dec 1995– Jan 1996
51[20]			*5.2±0.3*	1.9±0.4 *1.8±0.4*				Cranmore Mountain NH	Apr– May, 2000
52			6.54	3.36 *2.61*				Southern New Hampshire	Jul 2000- Sep 2001
54[22]			5.3±0.3 *3.3*[†]	0.9±0.3 *0.7±0.2*	6.2±0.4			Mt Zirkel Wilderness Area, CO (MZVS study)	Aug-Oct 1995
56a[23]	2.4	1.7				2.6, 0.45[‡]		Meadview AZ	Apr-Sep 1998
56b[23]	2.2	1.9				3.1, 0.34[‡]		Spirit Mountain NV	Apr-Sep 1998

Footnotes for multi-linear regression method table

All values reported for a wavelength of 550 nm unless otherwise stated in the note table. Values correspond to fine mode unless otherwise noted in the column header or by foot note. Size ranges and relative humidity (when reported) are stated in the MLR note table or in the footnotes. MLR method includes internally mixed and externally mixed methods, also found in the MLR note table for each entry.

In the "sulfate" column, values corresponding to dry ammonium sulfate are italicized.
In the "POM" column, values we normalized to POM multiplier of 1.8 are italicized

[†] We converted to dry ammonium sulfate

[1] Two separate MLR runs were performed, one with fine mass (Dp < 2 µm) and coarse mass (2-10 µm). The second was with total dust (Dp < 10 µm) and fine sulfate ion (Dp < 2 µm).

[2] Sulfate is PM2.5 ammonium sulfate, soil is PM2.5.

[3] Average and standard deviation of unweighted and effective-variance weighted estimates (see notes 11a and 11b). Coarse refers to PM10 – PM2.5.

[4] Average and standard deviation of unweighted and effective-variance weighted estimates (see notes 11c and 11d). Coarse refers to PM10 – PM2.5.

[5] Average and standard deviation of unweighted and effective-variance weighted estimates (see notes 11e and 11f). Coarse refers to PM10 – PM2.5.

[6] Reporting annual values only. Dust corresponds to PM2.5 mode.

[7] Organic carbon values are for non-volatile organics and semi-volatile organics, respectively (see notes 15a and 15b).

[8] Fine mixed refers to fine mass – nss-SO4 ion. Sulfate is sulfate ion

[9] Organic carbon value refers to carbon-containing aerosols

[10] Average and standard deviation of effective variance weighting with and without intercepts, and no weighting (see notes 25a, 25b, and 25c) for PM2.5.

[11] Average and standard deviation of effective variance weighting with and without intercepts, no weighting, and average absolute difference < 20 % effective variance weighting (see notes 25d, 25e, 25f, and 25g) for PM2.5.

[12] Average and standard deviation of effective variance weighting with and without intercepts, no weighting, and average absolute difference < 20 % effective variance weighting (see notes 25h, 25i, 25j, and 25k) for PM2.5.

[13] Average and standard deviation of effective variance weighting with and without intercepts, and no weighting (see notes 25l, 25m, and 25n) for PM2.5.

[14] Sulfate corresponds to sulfate ion for Dp < 10 µm. Fine mixed is residual mass for Dp < 1 µm and coarse mixed is for residual mass for 1 < Dp < 10 µm.

[15] Average and standard deviation for RITS93 and RITS94 (see notes 44a and 44c). Sulfate is nss-SO4 ion for Dp < 10 µm. Sea salt is listed for Dp < 1 µm and 1 < Dp < 10 µm, respectively.

[16] Sulfate ion, all values are for Dp < 10 µm.

[17] Sulfate ion and sea salt for Dp < 1 µm

[18] Sulfate ion and other values for Dp < 10 µm

[19] Fine sulfate corresponds to ammonium salts (SO4+NO3+NH4). Mixed fine is everything besides salts. Average and standard deviation for OC back up filter added back and subtracted, respectively (see notes 50a and 50b)

[20] Sulfate is ammonium sulfate. Average and standard deviation of N/NE and W/SW air masses (notes 51a and 51b)

[21] Sulfate is ammonium sulfate

[22] Sulfate is ammonium sulfate and nitrate is ammonium nitrate. Average and standard deviation for uncorrected OC, OC corrected for positive organic artifact, and corrected for negative organic artifact, respectively. (OC numbers are for uncorrected and negative artifact correction only). See notes 54a, 54b and 54c.

[23] Mixed fine is PM2.5 haze. Mixed coarse is 2.5 < Dp < 15 µm haze. Dust is for fine and coarse mode, respectively.

Multi-Linear Regression Method Notes table with further details about measurement methods

Multi Linear Regression (MLR) Method Notes
[4] Mass from SFU samplers and total Bsp measured with a TSI 3563 nephelometer, corrected for non-Lambertian and truncation errors. Average instrument RH was 38 %. MLR performed twice: once with fine particle mass (Dp < 2 µm) and coarse particle mass (2 < Dp < 10 µm). The second MLR was performed with dust (Dp < 10 µm) and sulfur converted to sulfate ion (Dp < 2 µm). Internal and external mixture methods. (Dec 1995 - Oct 1997, Sde Boker, Negev desert, Israel)
[8] PM2.5 Esp mass and dry Bsp from a nephelometer at a wavelength of 530 nm for all PM2.5 aerosols, PM2.5 soil, and PM2.5 ammonium sulfate. External mixture method. (April-June 1999, Eagle Farm, Brisbane, Australia)
[11a] PM2.5 mass and Bsp from MRI model 1592 nephelometer at a wavelength at 530 nm. Coarse mode is PM10 – PM2.5. Internal mixture method. Unweighted regression. (Winter 1989-1990, Tucson, AZ,6 hour sampling durations)
[11b] PM2.5 mass and Bsp from MRI model 1592 nephelometer at a wavelength at 530 nm. Effective variance weighted regression. Coarse mode is PM10 – PM2.5. Internal mixture method. (Winter 1989-1990, Tucson, AZ, 6 hour sampling durations)
[11c] PM2.5 mass and Bsp from an ambient-temperature Optec NGN-2 nephelometer. Coarse mode is PM10 – PM2.5. Unweighted regression. Internal mixture method. (Summer 1996, Welby, CO,12 hour sampling durations)
[11d] PM2.5 mass and Bsp from an ambient-temperature Optec NGN-2 nephelometer. Coarse mode is PM10 – PM2.5. Effective variance weighted regression. Internal mixture method. (Summer 1996, Welby, CO,12 hour sampling durations)

Multi Linear Regression (MLR) Method Notes

[11e] PM2.5 mass and Bsp from an ambient-temperature Optec NGN-2 nephelometer. Coarse mode is PM10 – PM2.5. Unweighted regression. Internal mixture method. (Welby, CO, winter 1996,12 hour sampling durations)

[11f] PM2.5 mass and Bsp from an ambient-temperature Optec NGN-2 nephelometer. Coarse mode is PM10 – PM2.5. Effective variance weighted regression. Internal mixture method. (Welby, CO, winter 1996,12 hour sampling durations)

[14] Bext with Optec LPV-2 transmissometer. MLR with bext and organic material from BOSS, sulfate as ammonium sulfate, nitrate as ammonium nitrate, corrected for RH using Tang's curves, Dust as fine crustal material, assuming crustal is Fe and Si. Externally mixed method. (1990-1991, Canyonlands National Park, UT)

[15a] Bsp measured with OPTEC NGN-2 integrating nephelometer at a wavelength of 530 nm. Nitrate as ammonium nitrate. Organic carbon for non-volatile organic material, using a 1.64 multiplier. Externally mixed method. (Jan 30 - Feb 4 2001, Salt Lake City, UT)

[15b] Bsp measured with OPTEC NGN-2 integrating nephelometer at a wavelength of 530 nm. Organic carbon as semi-volatile organic material. Externally mixed method. (Jan 30 - Feb 4 2001, Salt Lake City, UT)

[16] Bsp by TSI 3563 nephelometer for RH < 50 %. Mixed fine mass is residual fine mass (PMfine - nss-SO4). Sulfate as nss-SO4. Internally mixed method. (June 20 - July 10 1996, Sde Boker, Negev Desert, Israel)

[20] Fine mass (Dp < 2 µm) and Bsp from TSI 3563 integrating nephelometer at 50 % RH. Coarse mode is $2 < Dp < 10$ µm. Internally mixed method (Feb 18 - March 15 1997, Sde Boker, Negev Desert, Israel)

[21] Mass for Dp < 1 µm and RH < 40 % and Bsp from a MRI 1560 integrating nephelometer. Sulfate corresponds to ammonium bisulfate. Mixed fine mass corresponds to residual mass for Dp < 1 µm (portion of gravimetric mass not identified by IC). (Jan-Dec 1995, Bondville, IL)

[25a] Bsp estimated with ELSIE. Nitrate as ammonium nitrate. Sulfate as ammonium sulfate. POM = 1.2*OC. Dust as residual mass. Effective variance weighting, no intercept. Externally mixed method. Wavelength not stated. RH = 26.1 %. (summer 1992, Meadview, AZ)

[25b] Bsp estimated with ELSIE. Nitrate as ammonium nitrate. Sulfate as ammonium sulfate. POM = 1.2*OC. Dust as residual mass. Effective variance weighting, with intercept. Externally mixed method. Wavelength not stated. RH = 26.1 %. (Summer 1992, Meadview, AZ)

[25c] Bsp estimated with ELSIE. Nitrate as ammonium nitrate. Sulfate as ammonium sulfate. POM = 1.2*OC. Dust as residual mass. No weighting. Wavelength not stated. Externally mixed method. RH = 26.1 %. (Summer 1992, Meadview, AZ)

[25d] Bsp estimated with ELSIE. Nitrate as ammonium nitrate. Sulfate as ammonium sulfate. POM = 1.2*OC. Dust as residual mass. Effective variance weighting, no intercept. Externally mixed method. Wavelength not stated. RH = 45.1 %. (Winter 1992, Meadview, AZ)

[25e] Bsp estimated with ELSIE. Nitrate as ammonium nitrate. Sulfate as ammonium sulfate. POM = 1.2*OC. Dust as residual mass. Effective variance weighting, with intercept. Externally mixed method. Wavelength not stated. RH = 45.1 %. (Winter 1992, Meadview, AZ)

[25f] Bsp estimated with ELSIE. Nitrate as ammonium nitrate. Sulfate as ammonium sulfate. POM = 1.2*OC. Dust as residual mass. No weighting. Wavelength not stated. Externally mixed method. RH = 45.1 %. (winter 1992, Meadview, AZ)

[25g] Bsp estimated with ELSIE. Nitrate as ammonium nitrate. Sulfate as ammonium sulfate. POM = 1.2*OC. Dust as residual mass. Absolute average difference < 20 % effective variance weighting. Externally mixed method. RH = 45.1 %. Wavelength not stated. (Winter 1992, Meadview, AZ)

[25h] Bsp estimated with ELSIE. Nitrate as ammonium nitrate. Sulfate as ammonium sulfate. POM = 1.2*OC. Dust as residual mass. Effective variance weighting, no intercept. Wavelength not stated. Externally mixed method. RH = 31.8 %. (Winter 1989-1990, Phoenix, AZ)

[25i] Bsp estimated with ELSIE. Nitrate as ammonium nitrate. Sulfate as ammonium sulfate. POM = 1.2*OC. Dust as residual mass. Effective variance weighting, with intercept. Wavelength not stated. Externally mixed method. RH = 31.8 %. (Winter 1989-1990, Phoenix, AZ)

[25J] Bsp estimated with ELSIE. Nitrate as ammonium nitrate. Sulfate as ammonium sulfate. POM = 1.2*OC. Dust as residual mass. No weighting. Wavelength not stated. Externally mixed method. RH = 31.8 %. (Winter 1989-1990, Phoenix, AZ)

[25k] Bsp estimated with ELSIE. Nitrate as ammonium nitrate. Sulfate as ammonium sulfate. POM = 1.2*OC. Dust as residual mass. Absolute average difference < 20 % effective variance weighting. Wavelength not stated. Externally mixed method. RH = 31.8 %. (Winter 1989-1990, Phoenix, AZ)

[25l] Bsp estimated with ELSIE. Nitrate as ammonium nitrate. Sulfate as ammonium bisulfate. POM = 1.2*OC. Dust as residual mass. Effective variance weighting, no intercept. Wavelength not stated. Externally mixed method. RH = 66.7 %. (Summer 1990, Uniontown, PA)

[25m] Bsp estimated with ELSIE. Nitrate as ammonium nitrate. Sulfate as ammonium bisulfate. POM = 1.2*OC. Dust as residual mass. Effective variance weighting, with intercept. Wavelength not stated. Externally mixed method. RH = 66.7 %. (Summer 1990, Uniontown, PA)

[25n] Bsp estimated with ELSIE. Nitrate as ammonium nitrate. Sulfate as ammonium bisulfate. POM = 1.2*OC. Dust as residual mass. No weighting. Wavelength not stated. Externally mixed method. RH = 66.7 %. (Summer 1990, Uniontown, PA)

[26] Bsp measured with a TSI 3563 integrating nephelometer and mass for fine mode (Dp < 2 µm) for coarse mode ($2 < Dp < 10$ µm). RH not stated. Internally mixed method. (1995-mid Feb 1997,Sde Boker, Negev Desert, Israel)

Multi Linear Regression (MLR) Method Notes

[30] Dry ammonium sulfate mass and Bsp for dry from Radiance Research M903 nephelometer at a wavelength of 530 nm. POM = 1.4*OC. Nitrate is ammonium nitrate. Soil is PM2.5. Externally mixed method. (July-Aug 1998, Grand Canyon National Park, AZ)

[36] Bsp from Radiance research nephelometer at a wavelength of 530 nm. Sulfate corresponds to nss-sulfate for average RH = 45 % and Dp < 1 µm. Sea salt corresponds to sodium ion for average RH = 45 % and 1 < Dp < 10 µm. Externally mixed method. (July 1995, Tenerife)

[39] Bsp with MRI 1550 nephelometer for Dp < 1 µm and RH = 30 %. Sulfate as ion. Externally mixed method. (Oct 1994 - March 1995, rural Great Hungarian Plain)

[43] Bsp measured with an integrating nephelometer at RH = 30 % and Dp < 10 µm. Sulfate corresponds to sulfate ion. Mixed fine corresponds to submicron residual mass. Mixed coarse corresponds to supermicron residual mass. Internally mixed method. (1991 & 1992, Pacific Ocean from 33 N to 12 S along 140 W, Cheeka Peak, WA, for PSI and MAGE samples)

[44a] Bsp was calculated from DMA and APS size distribution measurements at RH = 30 %. Sulfate corresponds to sulfate ion. Sea salt is submicron. Externally mixed method. (March-May 1993, 70 deg south to 55 north along 140 W, RITS 93)

[44b] Bsp was calculated from DMA and APS size distribution measurements at RH = 30 %. Sea salt is supermicron. Externally mixed method. (March-May 1993, 70 deg south to 55 north along 140 W, RITS 93)

[44c] Bsp was calculated from DMA and APS size distribution measurements at RH = 30 %. Sulfate corresponds to sulfate ion. Sea salt is submicron. Externally mixed method. (Nov 1993 - Jan 1994, 70 deg south to 55 north along 140 W, RITS 94)

[44d] Bsp was calculated from DMA and APS size distribution measurements at RH = 30 %. Sea salt is supermicron. Externally mixed method (Nov 1993 - Jan 1994, 70 deg south to 55 north along 140 W, RITS 94)

[46a] Bsp measured with a TSI 3563 integrating nephelometer at RH = 55 % and for Dp < 10 µm. Sulfate corresponds to nss-SO4 ion. POM = 1.6*OC for North American air masses and 2.1*OC for all other air masses. Externally mixed method. Mean values for North America, NH marine, dust, dust/biomass burning, biomass burning. (Jan 14-Feb 8, 1999, Norfolk, VA to Cape Town, South Africa)

[47d] Bsp measured with a TSI 3563 nephelometer for Dp < 1 µm and RH < 40 %. Sulfate corresponds to SO4 ion. Mixed fine aerosol corresponds to residual mass. Externally mixed method. (All year 1997 - 2000, Barrow, AK)

[48a] Bsp measured with TSI 3563 integrating nephelometer at RH = 55 % for Dp < 10 µm. Sulfate corresponds to nss-SO4 ion. POM = 1.6*OC. Dust refers to inorganic oxidized material. Mean for the entire experiment. Externally mixed method. (Feb-Mar 1999, Arabian Sea, Bay of Bengal, Indian Ocean -north and south of the ITCZ)

[50a] Heated Belfort-MRI 1550B nephelometer at a wavelength of 475 nm and RH < 60 %. Mixed fine aerosol corresponds to salts (SO4+NH4+NO3). OC back up filter added. Internally mixed method. (Dec 9 1995 - Jan 6 1996, Bakersfield Van Horn School, San Joaquin Valley, CA)

[50b] Heated Belfort-MRI 1550B nephelometer at a wavelength of 475 nm and RH < 60 %. Mixed fine corresponds to all other species besides salts. OC back up filter was added back. Internally mixed method. (Dec 9 1995 - Jan 6 1996, Bakersfield Van Horn School, San Joaquin Valley, CA)

[50c] Heated Belfort-MRI 1550B nephelometer at a wavelength of 475 nm and RH < 60 %. Mixed fine aerosol corresponds to salts (SO4+NH4+NO3). OC back up filter was subtracted. Internally mixed method. (Dec 9 1995 - Jan 6 1996, Bakersfield Van Horn School, San Joaquin Valley, CA)

[50d] Heated Belfort-MRI 1550B nephelometer at a wavelength of 475 nm and RH < 60 %. Mixed fine aerosol corresponds to all other species besides salts. OC back up filter was subtracted. Internally mixed method. (Dec 9 1995 - Jan 6 1996, Bakersfield Van Horn School, San Joaquin Valley, CA)

[51a] Bsp measured with Radiance Research M903 nephelometer at 530 nm at ambient RH (< 50 % typically). Sulfate corresponds to ammonium sulfate. POM = 1.7*OC. OC from TOT. Externally mixed method. (April 18 - May 13, 2000, Cranmore Mountain, New Hampshire, for north/northeast air masses,)

[51b] Bsp measured with Radiance Research M903 nephelometer at 530 nm at ambient RH (<50 % typically). Sulfate corresponds to ammonium sulfate. POM = 1.7*OC. OC from TOT. Externally mixed method. (April 18 - May 13, 2000, Cranmore Mountain, New Hampshire, for west/southwest air masses)

[52] Bsp from Radiance Research M903 nephelometer at a wavelength of 530 nm. Sulfate corresponds to ammonium sulfate. POM =1.4*OC from TOT method. Values correspond to all measurements. Externally mixed method. (July 2000-Sept 2001, rural site in southern New Hampshire)

[54a] PM2.5 mass and Bsp with TSI 3563 nephelometer for RH < 52 %. Sulfate corresponds to ammonium sulfate. POM = 1.4*OC). Nitrate corresponds to ammonium nitrate. Uncorrected OC. Externally mixed method. (Aug 3 - Sept 2, 1995 and Sept 15 - Oct 15 1995, Buffalo Pass, Mt Zirkel Wilderness Area, CO)

[54b] PM2.5 mass and Bsp with TSI 3563 nephelometer for RH < 52 %. Sulfate corresponds to ammonium sulfate. POM = 1.4*OC). Nitrate corresponds to ammonium nitrate. OC corrected for positive organic artifact. Externally mixed method. (Aug 3 - Sept 2, 1995 and Sept 15 - Oct 15 1995, Buffalo Pass, Mt Zirkel Wilderness Area, CO)

[54c] PM2.5 mass and Bsp with TSI 3563 nephelometer for RH < 52 %. Sulfate corresponds to ammonium sulfate. POM = 1.4*OC). Nitrate corresponds to ammonium nitrate. OC corrected for negative organic artifact. Externally mixed method. (Aug 3 - Sept 2, 1995 and Sept 15 - Oct 15 1995, Buffalo Pass, Mt Zirkel Wilderness Area, CO)

Multi Linear Regression (MLR) Method Notes
[56a] PM2.5 mass and Bsp measured with a MRI 1597 integrating nephelometers at wavelength of 525nm. Mixed fine corresponds to haze. Dust corresponds to PM2.5. Coarse mode aerosol corresponds to $2.5 < Dp < 15$ µm, both for haze and dust. Internally mixed method. (April-Sept 1998, Meadview, AZ)
[56b] PM2.5 mass and Bsp measured with a MRI 1597 integrating nephelometers at wavelength of 525nm. Mixed fine corresponds to haze. Dust corresponds to PM2.5. Coarse mode aerosol corresponds to $2.5 < Dp < 15$ µm, both for haze and dust. Internally mixed method. (April-Sept 1998, Spirit Mountain, NV)

Table 5. Summary of a literature survey of mass scattering efficiencies using the **partial scattering method.** The first column corresponds to the reference number and entry in the associated notes table. Entries correspond to the fine mode.

Partial Scattering Method Mass Scattering Efficiency (m² g⁻¹) *							
Partial Scattering Method Mass Scattering Efficiency (m² g⁻¹)*							
Notes	Fine Mode	Sulfate	POM	Nitrate	Dust	Location (Study)	Time
25a[1]		*3.5*	4.8 / *3.2*	3.8	2.4	Meadview AZ (MOHAVE)	Summer 1992,
25b[2]		***2.7***	**3.6** / ***2.4***	**3.3**	**2.3**	Meadview AZ (MOHAVE)	Summer 1992,
25c[1]		*4*	5 / *3.3*	4.1	2.1	Meadview AZ (MOHAVE)	Winter 1992,
25d[2]		***3.1***	**4** / ***2.7***	**3.7**	**2.4**	Meadview AZ (MOHAVE)	Winter 1992,
25e[1]		*2.7*	3.6 / *2.4*	3.8	2	Phoenix AZ	Winter 1989-1990
25f[2]		***2.2***	**3** / ***2***	**3.1**	**2.1**	Phoenix AZ	Winter 1989-1990,
25g[1]		6.9 / *2.9†*	8.5 / *5.7*	1.8	4.3	Uniontown PA	Summer 1990
25h[2]		**7** / ***2.9†***	**8.8** / ***5.9***	**3.7**	**4.2**	Uniontown PA	Summer 1990
41a[3]		*1.23*	3.81 / *2.5*			Bondville IL	May-Dec 1994
41b[4]		5.78	6.9 / *4.6*			Bondville IL	May-Dec 1994
53a[5]	**4.5**	**7.1** / ***3.4†***	**5.6** / ***3.11***	**6.6**		Denver CO	Jan 5 1998
53b[6]	**2.3**	***2.1***	**4.0** / ***2.2***	**2.3**		Denver CO	Jan 13 1998
54a[7]		2.47	3.61 / *2.8*	2.63	1.76	Mt Zirkel Wilderness Area CO (MZVS)	Aug, Sep Oct 1995
58a		16 / *2.7†*	6.7 / *5.2*			Hopi Point, Grand Canyon National Park AZ (NGSVS)	Jan 18, 1990
58b		6.3 / *3.2†*	5.3 / *4.12*			Hopi Point, Grand Canyon National Park AZ (NGSVS)	Jan 20, 1990
58c		*4.6*	4.5 / *3.5*			Hopi Point, Grand Canyon National Park AZ (NGSVS)	Jan 21, 1990
58d		*3.4*	5.7 / *4.4*			Hopi Point, Grand Canyon National Park AZ (NGSVS)	Jan 22, 1990
58e		5.6 / *2.4†*	6.3 / *4.9*			Hopi Point, Grand Canyon National Park AZ) (NGSVS)	Jan 30, 1990
58f		3.5 / *2.0†*	8.1 / *6.3*			Hopi Point, Grand Canyon National Park AZ (NGSVS)	Feb 12, 1990
58g		8 / *2.7†*	5.6 / *4.9*			Hopi Point, Grand Canyon National Park, AZ (NGSVS)	Feb 13, 1990
58h		15.4 / *2.2†*	6.7 / *5.2*			Hopi Point, Grand Canyon National Park AZ (NGSVS)	Feb 19, 1990

Notes	Fine Mode	Sulfate	POM	Nitrate	Dust	Location (Study)	Time
58i		5.6 _3.2†_	5.6 _4.4_			Hopi Point, Grand Canyon National Park AZ (NGSVS)	Feb 28, 1990
58j		3 _1.9†_	7 _5.4_			Hopi Point, Grand Canyon National Park AZ (NGSVS)	Mar 1, 1990
58k		5.4 _2.6†_	4.2 _3.3_			Hopi Point, Grand Canyon National Park AZ (NGSVS)	Mar 2, 1990
58l		5.4 _2.7†_	5.1 _4.0_			Hopi Point, Grand Canyon National Park AZ (NGSVS)	Mar 3, 1990
58m		5.2 _1.93†_	1.3 _1.01_			Hopi Point, Grand Canyon National Park AZ (NGSVS)	Mar 4, 1990

Footnotes for partial scattering method table

*All values for a wavelength of 550 nm unless otherwise stated in the Notes table. Values in parentheses are reported as dry ammonium sulfate efficiencies in the literature. See notes table for the original form of sulfate and the relative humidity of the measurements.

In the "sulfate" column, values corresponding to dry ammonium sulfate are italicized.
In the "POM" column, values we normalized to POM multiplier of 1.8 are italicized
Estimates in bold correspond to constant-size scenario.

† We converted to dry ammonium sulfate

[1] Core/shell scenario with constant particle number. Values correspond to $PM_{2.5}$.
[2] Homogeneous composition with constant particle size. Values correspond to $PM_{2.5}$.
[3] Corresponds to PM2.5 aerosols at low RH (30-63 %), core/shell scenario used.
[4] Corresponds to PM2.5 aerosols high RH (> 75 %), core/shell scenario used.
[5] Corresponds to RH = 74 %. Interactive efficiency (conserves particle number).
[6] Corresponds to RH = 38 %. Interactive efficiency (conserves particle number).
[7] Constant composition as a function of size assumed

Partial Scattering Method Notes table with further details about measurement methods

Partial Method Notes
[25a] Esp estimated with ELSIE and MOUDI size distributions, assuming core/shell scenario with constant particle number. Sulfate corresponds to ammonium sulfate. Nitrate corresponds to ammonium nitrate. POM =1.2*OC. Dust corresponds to residual mass. Dust is 20 % soluble and OC is 60 % soluble. RH = 26.1 %. Wavelength ~ 530 nm. Results correspond to PM2.5 (Summer 1992, Meadview, AZ)
[25b] Esp estimated with ELSIE and MOUDI size distributions, assuming homogeneous composition and constant particle size. Sulfate corresponds to ammonium sulfate. Nitrate corresponds to ammonium nitrate. POM =1.2*OC. Dust corresponds to residual mass. Dust is 20 % soluble and OC is 60 % soluble. RH = 26.1 %. Wavelength ~ 530 nm. Results correspond to PM2.5 (Summer 1992, Meadview, AZ)
[25c] Esp estimated with ELSIE and MOUDI size distributions, assuming core/shell scenario with constant particle number. Sulfate corresponds to ammonium sulfate. Nitrate corresponds to ammonium nitrate. POM =1.2*OC. Dust corresponds to residual mass. Dust is 20 % soluble and OC is 60 % soluble. RH = 45.1%. Wavelength ~ 530 nm. Results correspond to PM2.5 (Winter 1992, Meadview, AZ)

Partial Method Notes

[25d] Esp estimated with ELSIE and MOUDI size distributions, assuming homogeneous composition and constant particle size. Sulfate corresponds to ammonium sulfate. Nitrate corresponds to ammonium nitrate. POM =1.2*OC. Dust corresponds to residual mass. Dust is 20 % soluble and OC is 60 % soluble. RH = 45.1 %. Wavelength ~ 530 nm. Results correspond to PM2.5 (Winter 1992, Meadview, AZ)

[25e] Esp estimated with ELSIE and MOUDI size distributions, assuming core/shell scenario with constant particle number. Sulfate corresponds to ammonium sulfate. Nitrate corresponds to ammonium nitrate. POM =1.2*OC. Dust corresponds to residual mass. Dust is 20 % soluble and OC is 60 % soluble. RH = 31.8 %. Wavelength ~ 530 nm. Results correspond to PM2.5 (Winter 1989-1990, Phoenix, AZ)

[25f] Esp estimated with ELSIE and MOUDI size distributions, assuming homogeneous composition and constant particle size. Sulfate corresponds to ammonium sulfate. Nitrate corresponds to ammonium nitrate. POM =1.2*OC. Dust corresponds to residual mass. Dust is 20 % soluble and OC is 60 % soluble. RH = 31.8 %. Wavelength ~ 530 nm. Results correspond to PM2.5 (Winter 1989-1990, Phoenix, AZ)

[25g] Esp estimated with ELSIE and MOUDI size distributions,assuming core/shell with constant particle number. Sulfate corresponds to ammonium bisulfate. Nitrate corresponds to ammonium nitrate. POM =1.2*OC. Dust corresponds to residual mass. Dust is 20 % soluble and OC is 60 % soluble. RH = 66.7 %. Wavelength ~ 530 nm. Results correspond to PM2.5 (Summer 1990, Uniontown, PA)

[25h] Esp estimated with ELSIE and MOUDI size distributions, assuming homogeneous composition and constant particle size. Sulfate corresponds to ammonium bisulfate. Nitrate corresponds to ammonium nitrate. POM =1.2*OC. Dust corresponds to residual mass. Dust is 20 % soluble and OC is 60 % soluble. RH = 66.7 %. Wavelength ~ 530 nm. Results correspond to PM2.5 (Summer 1990, Uniontown, PA)

[41a] MOUDI size distributions, computed for PM2.5 ammonium sulfate for low RH (30- 63 %), POM (=1.2*OC) assuming OC is 60 % soluble using ELSIE. Core/shell scenario assumed. (May-Dec 1994, Bondville, IL)

[41b] MOUDI size distributions, computed for PM2.5 ammonium sulfate for high RH (RH > 75 %), POM (=1.2*OC) assuming OC 60 % is soluble using ELSIE. Core/shell scenario assumed. (May-Dec 1994, Bondville, IL)

[53a] MOUDI size distribution (0.03 < Dp < 3.16 um) and ELSIE calculations. Water soluble organic mass taken to be 25% of total carbon. Sulfate corresponds to ammonium sulfate mass. Nitrate form not stated. POM multiplier not stated. RH = 74 %. Wavelength not stated. Interactive efficiency. (Jan 5 1988, Denver, CO, northeasterly flow)

[53b] MOUDI size distribution (0.03 < Dp < 3.16 um) and ELSIE calculations. Water soluble organic mass taken to be 25% of total carbon. Sulfate corresponds to ammonium sulfate mass. Nitrate form not stated. POM multiplier not stated. RH = 38 %. Wavelength not stated. Interactive efficiency. (Jan 13 1988, Denver, CO, stagnant air mass)

[54a] Results from ELSIE for ammonium sulfate or bisulfate, ammonium nitrate, POM (=1.4*OC) and dust. Size distributions inverted from Bsp measurements from a TSI nephelometer. Constant composition as a function of size. (Aug 3 - Sept 2, 1995 and Sept 15 - Oct 15 1995, Buffalo Pass, Mt Zirkel Wilderness Area, CO)

[58a] Esp calculated for ammonium sulfates and water (per gram of ammonium sulfate), carbonaceous aerosol (POM =1.4*OC) using composite model and MOUDI size distributions at RH = 92.2 %, and at a wavelength of 525 nm. NGS study. (Jan 18, 1990, Hopi Point, Grand Canyon National Park, AZ)

[58b] Esp calculated for ammonium sulfates and water (per gram of ammonium sulfate), carbonaceous aerosol (POM =1.4*OC) using composite model and MOUDI size distributions at RH = 63.3 %, and at a wavelength of 525 nm. NGS study. (Jan 20, 1990, Hopi Point, Grand Canyon National Park, AZ)

[58c] Esp calculated for ammonium sulfates and water (per gram of ammonium sulfate), carbonaceous aerosol (POM =1.4*OC) using composite model and MOUDI size distributions at RH = 44.8 %, and at a wavelength of 525 nm. NGS study. (Jan 21, 1990, Hopi Point, Grand Canyon National Park, AZ)

[58d] Esp calculated for ammonium sulfates and water (per gram of ammonium sulfate), carbonaceous aerosol (POM =1.4*OC) using composite model and MOUDI size distributions at RH = 32.9 %, and at a wavelength of 525 nm. NGS study. (Jan 22, 1990, Hopi Point, Grand Canyon National Park, AZ).

[58e] Esp calculated for ammonium sulfates and water (per gram of ammonium sulfate), carbonaceous aerosol (POM =1.4*OC) using composite model and MOUDI size distributions at RH = 72.2 %, and at a wavelength of 525 nm. NGS study. (Jan 30, 1990, Hopi Point, Grand Canyon National Park, AZ)

[58f] Esp calculated for ammonium sulfates and water (per gram of ammonium sulfate), carbonaceous aerosol (POM =1.4*OC) using composite model and MOUDI size distributions at RH = 53.6 % and at a wavelength of 525 nm. NGS study. (Feb 12, 1990, Hopi Point, Grand Canyon National Park, AZ)

[58g] Esp calculated for ammonium sulfates and water (per gram of ammonium sulfate), carbonaceous aerosol (POM =1.4*OC) using composite model and MOUDI size distributions at RH = 81.8 %, and at a wavelength of 525 nm. NGS study. (Feb 13, 1990, Hopi Point, Grand Canyon National Park, AZ),

[58h] Esp calculated for ammonium sulfates and water (per gram of ammonium sulfate), carbonaceous aerosol (POM =1.4*OC) using composite model and MOUDI size distributions at RH = 92.6 %, and at a wavelength of 525 nm. NGS study. (Feb 19, 1990, Hopi Point, Grand Canyon National Park, AZ)

Partial Method Notes

[58i] Esp calculated for ammonium sulfates and water (per gram of ammonium sulfate), carbonaceous aerosol (POM =1.4*OC) using composite model and MOUDI size distributions, RH = 55.2 %, and at a wavelength of 525 nm. NGS study. (Feb 28, 1990, Hopi Point, Grand Canyon National Park, AZ)

[58j] Esp calculated for ammonium sulfates and water (per gram of ammonium sulfate), carbonaceous aerosol (POM =1.4*OC) using composite model and MOUDI size distributions, RH = 48.0 %, and at a wavelength of 525 nm. NGS study. (Mar 1, 1990, Hopi Point, Grand Canyon National Park, AZ)

[58k], Esp calculated for ammonium sulfates and water (per gram of ammonium sulfate), carbonaceous aerosol (POM =1.4*OC) using composite model and MOUDI size distributions, RH = 67.9 %, and at a wavelength of 525 nm. NGS study. (Mar 2, 1990, Hopi Point, Grand Canyon National Park, AZ)

[58l] Esp calculated for ammonium sulfates and water (per gram of ammonium sulfate), carbonaceous aerosol (POM =1.4*OC) using composite model and MOUDI size distributions, RH = 63.5 %, and at a wavelength of 525 nm. NGS study. (Mar 3, 1990, Hopi Point, Grand Canyon National Park, AZ)

[58m] Esp calculated for ammonium sulfates and water (per gram of ammonium sulfate), carbonaceous aerosol (POM =1.4*OC) using composite model and MOUDI size distributions, RH = 76.5 %, and at a wavelength of 525 nm. NGS study. (Mar 4, 1990, Hopi Point, Grand Canyon National Park, AZ)

Table 7. Summary of mass absorption and scattering efficiencies (α_{ap}) of light absorbing carbon (LAC) and other species. The first column corresponds to the reference number and entry in the associated notes table. The method table refers to the type of method used to compute α_{ap} (see footnotes).

Mass Absorption Efficiency and LAC Scattering Efficiency (m^2 g^{-1})*								
Note	Method	α_{sp} (LAC)	Specific α_{ap} (fine mode)	Specific α_{ap} (coarse mode)	α_{ap} (LAC)	α_{ap} (Soil)	α_{ap} (POM)	Location/Study	Time
5	M-1				8.1 *(13)*			Big Bend National Park TX (BRAVO)	Sep-Oct 1999
7[1]	M-1				18.3, 9.3, 5.3			Atlanta GA (Supersite)	Jul-Sep 1999
8[2]	MLR-1&2	3.89	1.52	0.22	9.08 *(10.5)*, 0.32	0.17	1.11	Brisbane Australia	Apr-Jun 1999
12[3]	M-1				20, 12			Maldives (INDOEX) ($b_{sp} <$ 25 Mm^{-1})	Feb–Mar 1999
12[4]	M-1				13, 17			Maldives (INDOEX) (25 $< b_{sp} <$ 55 Mm^{-1})	Feb–Mar 1999
12[5]	M-1				14, 10			Maldives (INDOEX) ($b_{sp} >$ 55 Mm^{-1})	Feb–Mar 1999
12[6]	M-1				16, 12			Maldives Bay of Bengal trajectory (INDOEX study)	Feb–Mar 1999
12[7]	M-1				16			Maldives Arabian trajectory (INDOEX study)	Feb–Mar 1999
13a	T-2				7.3			Bondville IL	Jun–Sep 1997
13b	T-2				6			Bondville IL	Jun–Sep 1997
13c	T-2				3.6			Bondville IL	Jun–Sep 1997
13d	T-2				5.1			Bondville IL	Jun–Sep 1997
13e	T-2				4.7			Bondville IL	Jun–Sep 1997
13f	T-2				1.7			Bondville IL	Jun–Sep 1997
16	MLR-1&2				8.9			Sde Boker Israel (ARACHNE study)	Jun-Jul 1996
19[8]	T-2				6.5 ± 0.2			Santa Maria Azores	Jun 1992
24a[9]	M-1				12 *(19.2)*			Grenoble France	
24b[9]	M-1				12 *(19.2)*			Paris France	
24c[9]	M-1				20 *(32)*			Savannah areas, Ivory Coast and Congo	
24d[9]	M-1				18 *(28.8)*			Western Mediterranean	

Note	Method	α_{sp} (LAC)	Specific α_{ap} (fine mode)	Specific α_{ap} (coarse mode)	α_{ap} (LAC)	α_{ap} (Soil)	α_{ap} (POM)	Location/Study	Time
24e[9]	M-1				5 (*8*)			Remote Areas northern tropical Pacific, Mace Head, Ireland; Greenland	
27a	M-1				14.22 (*16.4*)			Mount Rainier National Park WA	Summer 1990
27b	M-1				16.9 (*19.5*)			North Cascades National Park WA	Summer 1990
28a[10]	MLR-1&2				12.5 (*14.4*)	1.8	3.3	Meadview AZ	Summer 1992
28b[11]	MLR-1&2				11.7 (*13.5*)	3.7	7.9	Meadview AZ	Summer 1992
38	T-1		0.37		12.9 (*12.4*)			Yosemite National Park (YACS)	Jul-Sep 2002
40a[12]	M-1				3.58 (*4.5*)			Brighton, CO (NFRAQS)	Jan 1997
40b[13]	M-1				8±4 (*10 ± 5*)			Brighton CO (NFRAQS)	Dec 1996, Jan 1997
46a	MLR-2	3.6						Norfolk VA to Cape Town South Africa, (Aerosols99)	Jan-Feb 1999
46b	T-3	3.3						Norfolk VA to Cape Town South Africa, (Aerosols99)	Jan-Feb 1999
46[14]	T-3	4.0±1.4						Norfolk VA to Cape Town, South Africa (Aerosols99)	Jan-Feb 1999
48a	MLR-2				8.5			Indian Ocean (INDOEX)	Feb-Mar 1999
48b	T-3				8.8			Indian Ocean (INDOEX)	Feb-Mar 1999
48[15]	T-3	4.4±1.7						Indian Ocean (INDOEX)	Feb-Mar 1999
49[16]	T-3	3.88±0.8						Pacific Ocean, coastal Asia (ACE-ASIA)	Spring 2001
49[17]	T-3	0.61±0.14‡						Pacific Ocean, coastal Asia (ACE-ASIA)	Spring 2001
49[18]	T-3	2.6±0.4♦						Pacific Ocean, coastal Asia (ACE-ASIA)	Spring 2001
51[19]	MLR-2				10.2±0.8			Cranmore Mountain NH	Apr–May, 2000
52	MLR-2				12.85			Southern New Hampshire	Jul 2000-Sep 2001
53[20]	P	1.5±0.9			10.3			Denver CO	Jan 1988

Note	Method	α_{sp} (LAC)	Specific α_{ap} (fine mode)	Specific α_{ap} (coarse mode)	α_{ap} (LAC)	α_{ap} (Soil)	α_{ap} (POM)	Location/Study	Time
56[21]	M-1		0.37	0.082				Spirit Mountain NV	Apr-Sep 1989,
57	M-1				8.6 (*8.8*)			Linan China	Oct-Nov 1999

Footnotes for absorption efficiency table

Values reported for a wavelength of 550 nm, unless stated in the notes table. Italicized efficiencies in parentheses correspond to estimates corrected to 550 nm assuming a λ^{-1} relationship. Size range and relative humidity (when reported) and instruments are stated in the Measurement note table or below

Methods:
M-1 refers to measurement method where bsp and mass are both measured
M-2 refers to measurement method where bsp is measured and mass derived from volume distributions
T-1 refers to theoretically calculated bsp and specific mass derived from number or volume size distributions
T-2 refers to theoretically calculated bsp and mass size distributions per species
T-3 refers to theoretically calculated bsp and mass is apportioned to a species from number or volume size distribution measurements
MLR-1 refers to multi-linear regression assuming an internally mixed aerosol model
MLR-2 refers to a multi-linear regression assuming an externally mixed aerosol model
P refers to partial scattering method

‡ Corresponds to coarse mode (supermicron)
♦ Corresponds to total modes (supramicron, fine + coarse)

[1] Three values listed correspond to estimates from $PM_{2.5}$ filter mass, summed MOUDI mass and R&P mass, respectively (see notes 7a, 7b, and 7c).
[2] Eap for EC is for PM2.5 and coarse ($PM_{10} - PM_{2.5}$), respectively. Soil and OC are also coarse.
[3] Values correspond to Caltech data and R/V Ronald Brown data (see notes 12a and 12b)
[4] Values correspond to Caltech data and R/V Ronald Brown data (see notes 12c and 12d)
[5] Values correspond to Caltech data and R/V Ronald Brown data (see notes 12e and 12f)
[6] Values correspond to Caltech data and R/V Ronald Brown data (see notes 12g and 12h)
[7] Values correspond to R/V Ronald Brown data (see notes 12i)
[8] Average and standard deviation of two polluted air mass events at RH values of 81 % and 77 % (see notes 19a and 19b)
[9] Time periods not given in manuscript
[10] $PM_{2.5}$ O4 and OP fractions for organic carbon and E1 and E2 fractions for EC. Regression performed with intercept (see notes 28a and 28b)
[11] $PM_{2.5}$ O4 and OP fractions for organic carbon and E1 and E2 fractions for EC. Regression performed without intercept (see notes 28c and 28d)
[12] Comparison of photoacoustic and TOR EC data (see note 40a)
[13] Comparison of aethalometer and photoacoustic data. Average and standard deviation of days in Dec 1996 and Jan 1997 (see notes 40b and40c)
[14] For Dp < 10 µm. Average and standard deviation of values for North America, NH marine, African dust, African dust/biomass burning and biomass burning (see notes 46c-g)
[15] For Dp < 1.1 µm. Average and standard deviation of SH Atlantic, SH Indian Ocean, NH Indian Ocean, East Indian Subcontinent, Indian Subcontinent, Arabia, Arabia-Indian subcontinent, Arabian sea-coastal India (see notes 48c-j)
[16] For Dp < 1.1 µm. Average and standard deviation of polluted-Korea/Japan, polluted-Japan, volcano-polluted, dust+frontal, dust+Korea, dust+Shanghai (see notes 49a-f)
[17] For 1.1 < Dp < 10 µm. Average and standard deviation of polluted-Korea/Japan, polluted-Japan, volcano-polluted, dust+frontal, dust+Korea, dust+Shanghai (see notes 49g-l)
[18] For Dp < 10 µm. Average and standard deviation of polluted-Korea/Japan, polluted-Japan, volcano-polluted, dust+frontal, dust+Korea, dust+Shanghai (see notes 49m-r)
[19] Average and standard deviation of two air masses (see notes 51a and 51b)
[20] Average and standard deviation of two time periods and RH (74 % and 38 %).
[21] Computed from data in manuscript

Absorption Efficiency Method Notes table with further details about measurement methods

Mass Absorption Efficiency Notes
[5] Comparison between aethalometer and photoacoustic technique at a wavelength of 880 nm. (Sept 17- Oct 17, 1999, Big Bend National Park, TX)
[7a] TEOM PM2.5 mass and Bap measured with a PSAP at a wavelength of 550 nm. Average RH value of 48 %. (July 30 - Sept 3 1999, Atlanta, GA)
[7b] PM2.5 filter mass and Bap measured with a PSAP at a wavelength of 550 nm. Average RH value of 48 %. (July 30 - Sept 3 1999, Atlanta)
[7c] MOUDI mass (includes sum of all stages and after-filter, 0.056 < Dp < 1.78 um). Bap measured with a PSAP at a wavelength of 550 nm. Average RH value of 48 %. (July 30 - Sept 3 1999, Atlanta, GA)
[8] PM2.5 EC and dry Bsp from a nephelometer at a wavelength of 530 nm. PM2.5 mass and Babs measured by integrating plate laser absorption at a wavelength of 633 nm. Eap for soil, organic carbon are coarse (PM10 –PM2.5). Eap for EC for PM2.5 and PM10, respectively. Soil form not stated. OC multiplier not stated.(April-June 1999, Eagle Farm, Brisbane, Australia)
[12a] Bap is measured with a PSAP at RH = 33 % and Dp < 1 um. Caltech data. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, for low Bsp regime (Bsp < 25 Mm-1))
[12b] Bap is measured with a PSAP at RH = 33 % and Dp < 1 um. Ronald Brown R/V data. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, for low Bsp regime (Bsp < 25 Mm-1))
[12c] Bap is measured with a PSAP at RH = 33 % and Dp < 1 um. Caltech data. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, medium Bsp regime (25 < Bsp < 55 Mm-1))
[12d] Bap is measured with a PSAP at RH = 33 % and Dp < 1 um. Ronald Brown R/V data. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, medium Bsp regime (25 < Bsp < 55 Mm-1))
[12e] Bap is measured with a PSAP at RH = 33 % and Dp < 1 um. Caltech data. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, high Bsp regime (Bsp > 55 Mm-1))
[12f] Bap is measured with a PSAP RH = 33 % and Dp < 1 um. Ronald Brown R/V data. Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, high Bsp regime (Bsp > 55 Mm-1))
[12g] Bap is measured with a PSAP at RH = 33 % and Dp < 1 um. Caltech data. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, Bay of Bengal Trajectory)
[12h] Bap is measured with a PSAP at RH = 33 % and Dp < 1 um. Ronald Brown R/V data. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, Bay of Bengal Trajectory)
[12i] Bap is measured with a PSAP at RH = 33 % and Dp < 1 um. Ronald Brown R/V data. (Feb 11 - March 25, 1999, Kashidhoo Climate Observatory, Maldives, Arabian Sea Trajectory)
[13a] MOUDI size distributions, Eap corresponds to Dp = 0.09 um and density of 1.9. Babs measured by transmission of light with spectrophotometer, (June -Sept, 1997, Bondville, IL)
[13b] MOUDI size distributions, Eap corresponds to Dp = 0.16 um and density of 1.9. Babs measured by transmission of light with spectrophotometer, (June - Sept 1997, Bondville, IL).
[13c] MOUDI size distributions, Eap corresponds to Dp = 0.30 um and density of 1.9. Babs measured by transmission of light with spectrophotometer, (June - Sept 1997, Bondville, IL).
[13d] MOUDI size distributions, Eap corresponds to Dp = 0.55 um and density of 1.9. Babs measured by transmission of light with spectrophotometer, (June - Sept 1997, Bondville, IL).
[13e] MOUDI size distributions, Eap corresponds to Dp = 1.0 um and density of 1.9. Babs measured by transmission of light with spectrophotometer, (June - Sept 1997, Bondville, IL).
[13f] MOUDI size distributions, Eap corresponds to Dp = 2.7 um and density of 1.9. Babs measured by transmission of light with spectrophotometer, (June - Sept 1997, Bondville, IL).
[16] Bap by AE-9 aethalometer, corrected to 550 assuming 1/lambda. RH < 50 %. (June 20 - July 10 1996, Sde Boker, Negev Desert, Israel)
[19a] MOUDI size distributions at ambient humidity (0.32 < Dp < 10 um, RH = 81 %). Soot size distributions assumed to match nss-SO4. (June 19 2000-0700 1992, Santa Maria, Azores archipelago, continental polluted air)
[19b] MOUDI size distributions at ambient humidity (0.32 < Dp < 10 um, RH = 77 %). Soot size distributions assumed to match nss-SO4. (June 20 0800-1900 1992, Santa Maria, Azores archipelago, continental polluted air)
[24a] McGee Scientific Aethalometer and thermally analyzed black carbon concentrations at a wavelength of 880 nm. (Grenoble, France)
[24b] McGee Scientific Aethalometer and thermally analyzed black carbon concentrations at a wavelength of 880 nm (Paris, France)
[24c] McGee Scientific Aethalometer and thermally analyzed black carbon concentrations at a wavelength of 880 nm (Savannah areas, Ivory Coast and Congo)

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[24d] McGee Scientific Aethalometer and thermally analyzed black carbon concentrations at a wavelength of 880 nm (Western Mediterranean)

[24e] McGee Scientific Aethalometer and thermally analyzed black carbon concentrations at a wavelength of 880 nm (Remote Areas (northern tropical Pacific, Mace Head, Ireland; Greenland)

[27a] PM2.5 Babs by LIPM and LAC mass. (summer 1990, Tahoma Woods, Mount Rainier National Park, WA)

[27b] PM2.5 Babs by LIPM and LAC mass. (summer 1990, Marblemount, North Cascades National Park, WA)

[28a] PM2.5 Babs by LIPM. Mass corresponds to the O4+OP fractions of OC by TOR. Regression intercept of 3.1. Wavelength not stated. (Summer 1992, Meadview, Grand Canyon National Park, AZ)

[28b] PM2.5 Babs by LIPM. Mass corresponds to the E1+E2 fractions of EC by TOR. Regression intercept of 3.1. Wavelength not stated. (Summer 1992, Meadview, Grand Canyon National Park, AZ)

[28c] PM2.5 Babs by LIPM. Mass corresponds to the O4+OP fractions of OC by TOR. Regression with no intercept. Wavelength not stated. (Summer 1992, Meadview, Grand Canyon National Park, AZ)

[28d] PM2.5 Babs by LIPM. Mass corresponds to the E1+E2 fractions of EC by TOR. Regression with no intercept. Wavelength not stated. (Summer 1992, Meadview, Grand Canyon National Park, AZ)

[38] DMA and OPC dry aligned size distributions (0.04 < Dp < 2 um) and retrieved refractive indices at a wavelength of 530 nm. Eap corresponds to integrated accumulation mode mass and to PM2.5 EC mass (July-Sept, 2002, Yosemite National Park, CA)

[40a] Regression of TOR EC vs photoacoustic Babs at a wavelength of 685 nm. (Jan 3 and 6-9, 1997, Brighton, CO)

[40b] Regression of BC from Magee Scientific AE-10IM aethalometer BC and photoacoustic Babs at a wavelength of 685 nm (avg Dec 17&18 1996, Brighton, CO)

[40c] Regression of BC from Magee Scientific AE-10IM aethalometer BC and photoacoustic Babs at a wavelength of 685 nm (avg Jan 3 and 6-9 1997, Brighton, CO)

[46a] Bap measured with PSAP at RH = 55 % and for Dp < 10 um. Mean values for North America, NH marine, dust, dust/biomass burning, biomass burning. (Jan 14-Feb 8, 1999, Norfolk, VA to Cape Town, South Africa)

[46b] Size distributions for Dp < 10 um, RH = 55 %. Esp for BC. Reported means for North America, NH marine, dust, dust/biomass burning, biomass burning, (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46c] Size distributions for Dp < 1.1 um, RH = 55 %. BC includes nss-K and associated SO4 and NO3. Mean for North America (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46d] Size distributions for Dp < 1.1 um, RH = 55 %. BC includes nss-K and associated SO4 and NO3. Mean for Northern Hemisphere marine, (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46e] Size distributions for Dp < 1.1 um, RH = 55 %. BC includes nss-K and associated SO4 and NO3. Mean for African dust, (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46f] Size distributions for Dp < 1.1 um, RH = 55 %. BC includes nss-K and associated SO4 and NO3. Mean for African dust/biomass burning, (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[46g] Size distributions for Dp < 1.1 um, RH = 55 %. BC includes nss-K and associated SO4 and NO3. Mean for biomass burning, (Jan 14 -Feb 8 1999, Norfolk, VA to Cape Town, South Africa)

[48a] Bap measured with PSAP for Dp < 1um at RH = 55 %. Mean for the entire experiment; (Feb-Mar 1999, Arabian Sea, Bay of Bengal, Indian Ocean -north and south of the ITCZ)

[48b] Size distributions for for Dp < 10 um and RH = 55 %. Mean for entire experiment. (Feb-March 1999, Arabian Sea, Bay of Bengal, Indian Ocean, north and south of the ITCZ)

[48c] Size distributions for Dp < 1.1 um and RH = 55 %. BC includes nss-K and associated SO4 and NO3. Mean for SH Atlantic (Feb-March 1999)

[48d] Size distributions for Dp < 1.1 um and RH = 55 %. BC includes nss-K and associated SO4 and NO3. Mean for SH Indian Ocean (Feb-March 1999)

[48e] Size distributions for Dp < 1.1 um and RH = 55 %. BC includes nss-K and associated SO4 and NO3. Mean for NH Indian Ocean, (Feb-March 1999)

[48f] Size distributions for Dp < 1.1 um and RH = 55 %. BC includes nss-K and associated SO4 and NO3. Mean for East Indian Subcontinent (Feb-March 1999)

[48g] Size distributions for Dp < 1.1 um and RH = 55 %. BC includes nss-K and associated SO4 and NO3. Mean for Indian Subcontinent, (Feb-March 1999)

[48h] Size distributions for Dp < 1.1 um and RH = 55 %. BC includes nss-K and associated SO4 and NO3. Mean for Arabia, (Feb-March 1999)

[48i] Size distributions for Dp < 1.1 um and RH = 55 %. BC includes nss-K and associated SO4 and NO3. Mean for Arabia-Indian subcontinent, (Feb-March 1999)

[48j] Size distributions for Dp < 1.1 um and RH = 55 %. BC includes nss-K and associated SO4 and NO3. Mean for Arabian sea, coastal India, (Feb-March 1999)

[49a] Size distributions for Dp < 1.1 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Polluted-Korea/Japan (mid-March to mid-April 2001)

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[49b] Size distributions for Dp < 1.1 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Polluted-Japan (mid-March to mid-April 2001)

[49c] Size distributions for Dp < 1.1 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Volcano+Polluted (mid-March to mid-April 2001)

[49d] Size distributions for Dp < 1.1 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for dust + Frontal (mid-March to mid-April 2001)

[49e] Size distributions for Dp < 1.1 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Dust + Korea (mid-March to mid-April 2001)

[49f] Size distributions for Dp < 1.1 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Dust + Shanghai (mid-March to mid-April 2001)

[49g] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Polluted-Korea/Japan, (mid-March to mid-April 2001)

[49h] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Polluted-Japan, (mid-March to mid-April 2001)

[49i] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Volcano+Polluted, (mid-March to mid-April 2001)

[49j] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for dust + Frontal (mid-March to mid-April 2001)

[49k] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Dust + Korea (mid-March to mid-April 2001)

[49l] Size distributions for 1.1 < Dp < 10 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Dust + Shanghai (mid-March to mid-April 2001)

[49m] Size distributions for Dp < 10 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Polluted-Korea/Japan (mid-March to mid-April 2001)

[49n] Size distributions for Dp < 10 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Polluted-Japan (mid-March to mid-April 2001)

[49o] Size distributions for Dp < 10 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Volcano+Polluted (mid-March to mid-April 2001)

[49p] Size distributions for Dp < 10 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for dust + Frontal (mid-March to mid-April 2001)

[49q] Size distributions for Dp < 10 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Dust + Korea (mid-March to mid-April 2001)

[49r] Size distributions for Dp < 10 um and RH = 55 %. EC includes nss-K and associated SO4 and NO3. Mean for Dust + Shanghai (mid-March to mid-April 2001)

[51a] Bap measured with PSAP at 565nm (corrected to 550 nm) at ambient RH (< 50 % typically. EC from TOT. (April 18 - May 13, 2000, Cranmore Mountain, New Hampshire, for north/northeast air masses)

[51b] Bap measured with PSAP at 565nm (corrected to 550 nm) at ambient RH (< 50 % typically. EC from TOT. (April 18 - May 13, 2000, Cranmore Mountain, New Hampshire, for west/southwest air masses)

[52] Bsp from Radiance Research M903 nephelometer at a wavelength of 530 nm. Bap with PSAP at 550 nm. Sulfate corresponds to ammonium sulfate. POM =1.4*OC from TOT method. Values correspond to all measurements. (July 2000-Sept 2001, rural site in southern New Hampshire)

[53a] MOUDI size distribution (0.03 < Dp < 3.16 um) and ELSIE calculations. RH = 74 %. Wavelength not stated. Interactive efficiency. (Jan 5 1998, Denver, CO, northeasterly flow)

[53b] MOUDI size distribution (0.03 < Dp < 3.16 um) and ELSIE calculations. RH = 38 %. Wavelength not stated. Interactive efficiency. (Jan 13 1998, Denver, CO, stagnant air mass)

[56] Eap is for a ratio of Babs from LIPM and PM2.5 aerosol. Coarse Eap is for 2.5 < Dp < 15 um gravimetric mass. Ratio computed from data in manuscript. (April-Sept 1989, Spirit Mountain, Nevada)

[57] PM2.5 mass and Bap measured with a PSAP at 565 nm for RH < 40 %. (Oct 28-Nov 20 1999, Linan, China)

Citations for Mass Scattering and Absorption Efficiencies

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