Posting type	Informational
Subject	Changed reporting of XRF sulfur
Module/Species	A/ S
Sites	entire network
Period	Starting 1/1/05
Submitter	W.H. White, white@crocker.ucdavis.edu

Supporting information

XRF sulfur data reported for sample dates in 2004 and most of 2003 were based on a non-standard value for the sulfur calibration foil: the value 12.0 µg/cm^2 was substituted for the value 13.8 µg/cm^2 quoted by the supplier. The adjusted value was used as early as February 2003, and may have been used still earlier. The rationale for using an adjusted value was not documented, and may have been to improve agreement with ion-chromatographic sulfate measurements.

Sulfur data for sample dates in 2005 are based on the quoted value of the foil, which yields reported values higher by the factor 13.8/12.0 = 1.15, or 15%. This reporting change, not the simultaneous switch from a helium-flushed system to one operating in vacuum (see Jan – Mar 2005 UC Davis QA/QC report), accounts for the bulk of the increase in reported S relative to reported $SO_4^=$ between 2004 and 2005 seen in Figure 1.

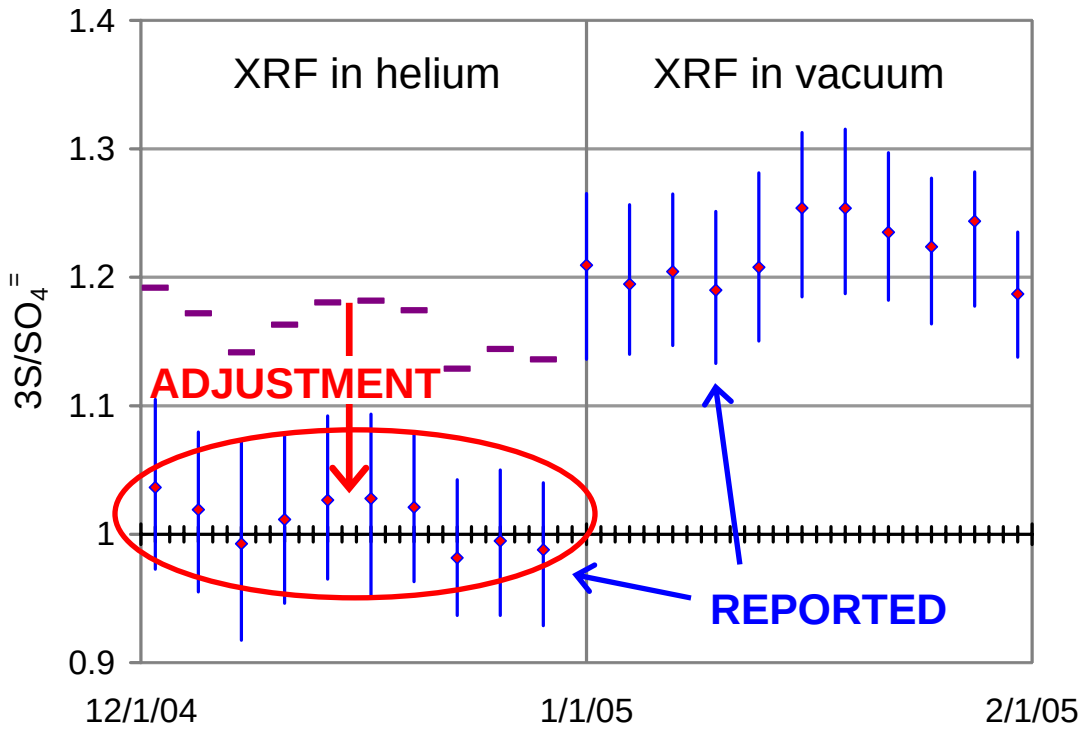

Figure 1. Median and interquartile range of the ratio 3[S]/[$SO_4^=$], over all network sample pairs in which both sulfur and sulfate were detected.

The magnitude of the reporting change is small relative to the range of sulfur concentrations reported across the network, as illustrated in Figure 2. However its systematic impact is likely to be evident in inter-annual comparisons, and should be accounted for in their interpretation.

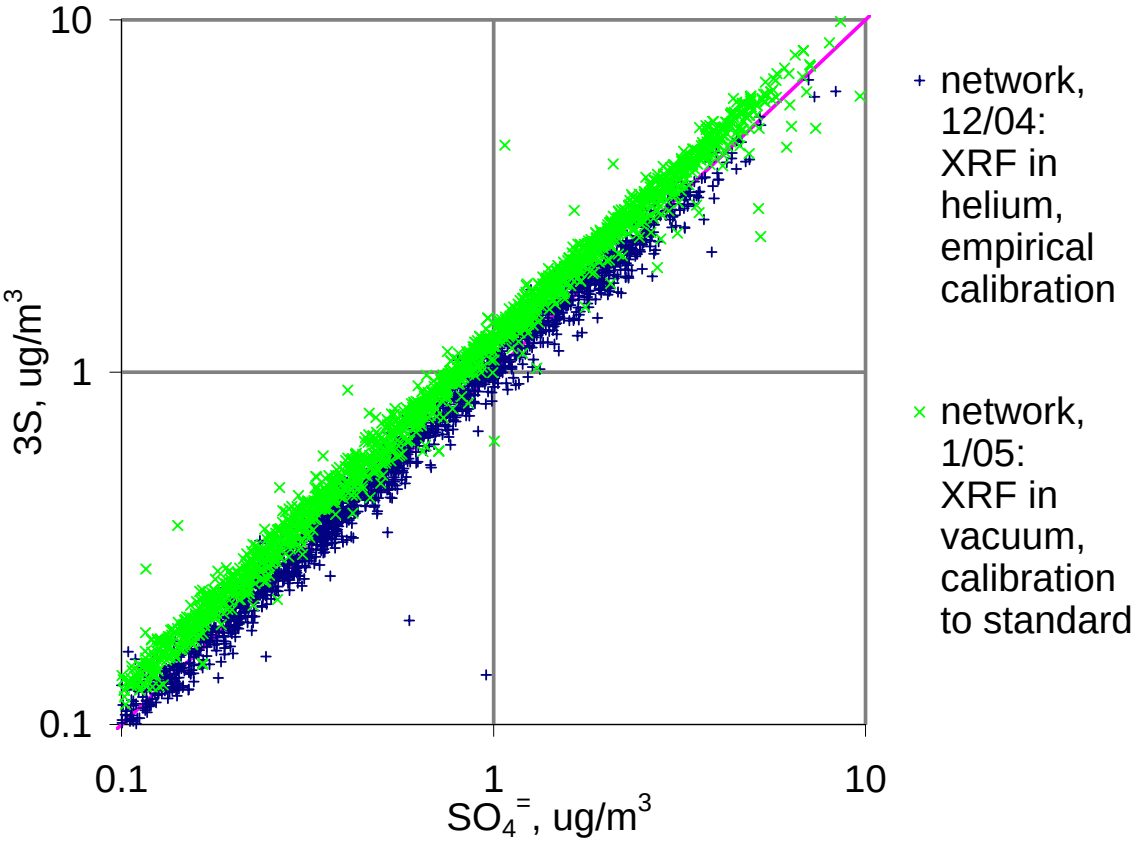

Figure 2. Twenty-four-hour concentrations in the range 0.1 ug/m^3 < 3S, $SO_4^=$ < 10 ug/m^3 throughout the network in December 2004 and January 2005.