

# Source apportionment of aerosols using $\delta^{34}\text{S}$ , $\delta^{18}\text{O}$ , ions, and trace metals

**Goal: Improve emission inventories of aerosols for the understanding of the relative roles of regional and distant sources on air quality and aerosol radiative forcing.**

**Step 1:** Perform analyses ON EXISTING filter samples from contrasting California airsheds (Lake Tahoe, SF Bay, SJV, and LA) over an annual cycle.

**Step 2:** Conduct short-term (~1 week) measurements at key locations which represent endmembers of various major emissions sources

**Step 3:** Apportion sources using multivariate statistical methods, back trajectories, and a chemical mass balance.

**Step 4:** Collect and analyze aerosol samples taken at the CalNex Supersites and aboard the Ron Brown, and integrate with other measurements from the campaign.

Emissions Source of Sulfur Aerosol	$\delta^{34}\text{S}$ (‰)	Tracer	Dominant Source
Sea water sulfate	$+21 \pm 1$	Zn, Cu	Oil refining and vehicle emissions
Biogenic DMS	$+18 \pm 2$	Al, Sr, Fe	Road dust and soil
Biogenic H <sub>2</sub> S	$-3 \pm 3$	Na, oxalate	DMS oxidation
Vehicle exhaust	$+5 \pm 3$	V, K	Biomass burning
Gasoline and diesel	$+9 \pm 1$	Hg	Asian industrial emissions
Oil Refineries	$+1 \pm 3$		
Power plant fuel oil	$+5 \pm 4$		
Ship exhaust	$+8$		
Biomass combustion	$+7 \pm 7$		