

## DRI CCN spectrometers

These instruments have participated in more than 25 field projects, most airborne.

Recent optical, electronic, and physical improvements have minimized or eliminated the need for data inversion.

Agreement between the two instruments over a common supersaturation (S) range when they are set for different supersaturation ranges assures confidence.

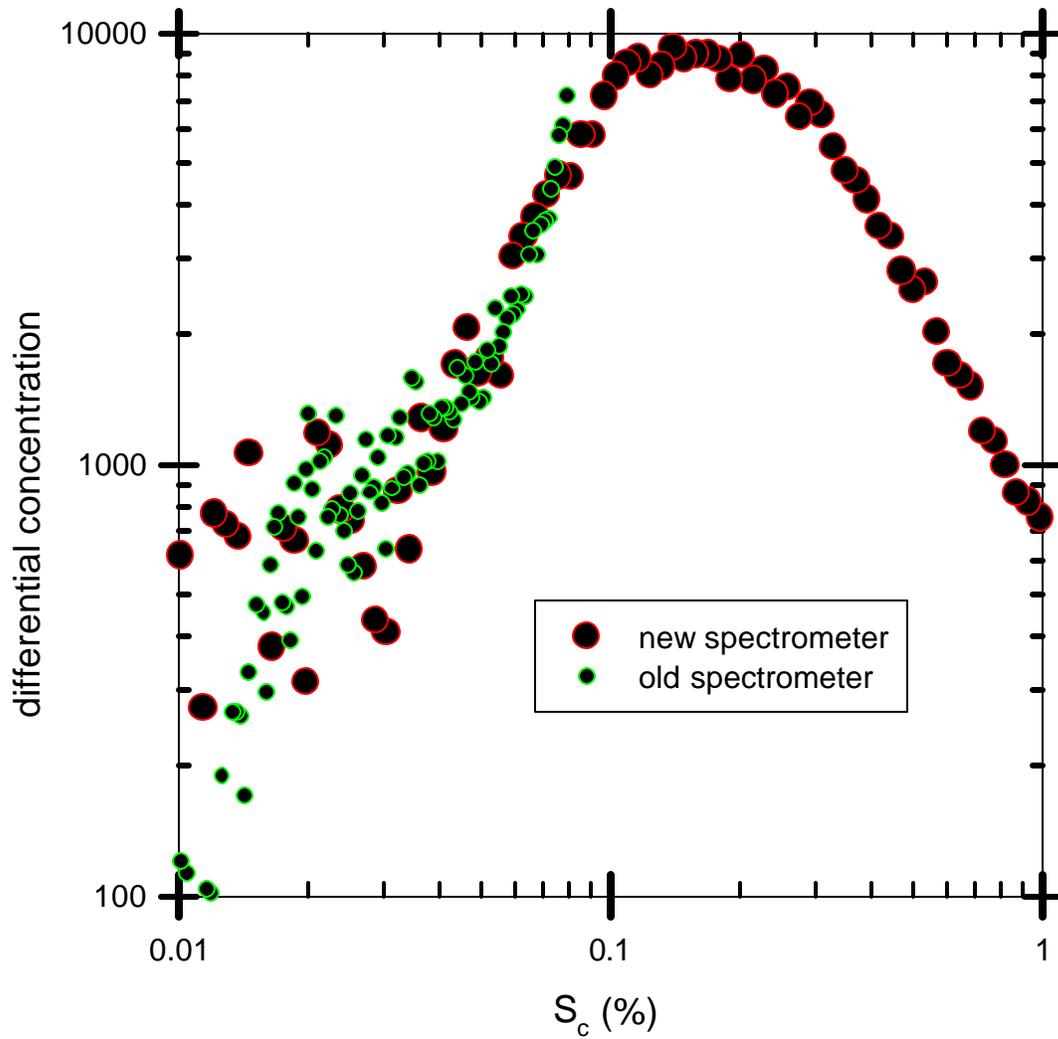
A wider S range is more challenging for spectral determinations. In the figures the instrument operating at the lower S range (old) should be more accurate over that range because it is a smaller range and because there is less interference from higher concentrations at higher S that can cause spectral broadening and coincidence pulses. Nevertheless, the new spectrometer shows excellent agreement with the old one in the overlapping 0.08-0.02% range. Such high concentrations are especially challenging for spectral determinations, but these concentrations are typical of the ARM site.

The S range has now been extended to 0.002%. But at this time coverage of the full 1-0.002% range requires both instruments. Thus, both will be operated during the IOP at 1-0.02 and 0.08-0.002% respectively. Moreover agreement in the overlap region for instruments operating over different ranges should be more reassuring than if both instruments operated over the same range of S. If one instrument should go down the upper range will still be covered.

With more than 100 channels of resolution it is possible to plot the data differentially as well as the traditional cumulative way (figs.).

Data are continuously available every few seconds. High time resolution is valuable to filter out very local pollution episodes (e.g., vehicles). Concentrations at several (e.g., 10-20) different S can be provided every minute with full spectral averages (sans spikes) every 10 minutes.

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4550 cm<sup>-3</sup>  
new spec. at delta T up to 7°C  
old spec. at delta T up to 4.3°C



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