

Testing of the 2DC 10-micron probe.

Background: Measurements of particle data in the radius range larger than about 25 μm and smaller than about 75 μm has traditionally been very difficult using ordinary 2D image probes. The reasons are that resolution for traditional probes is 25 μm for 2D probe, and that exceedingly high laser light intensities are needed for adequate sensing of very small particles. RAF has modified an existing probe to have a 10- μm resolution, and the probe has undergone several modifications before testing in ARISTO-2016.

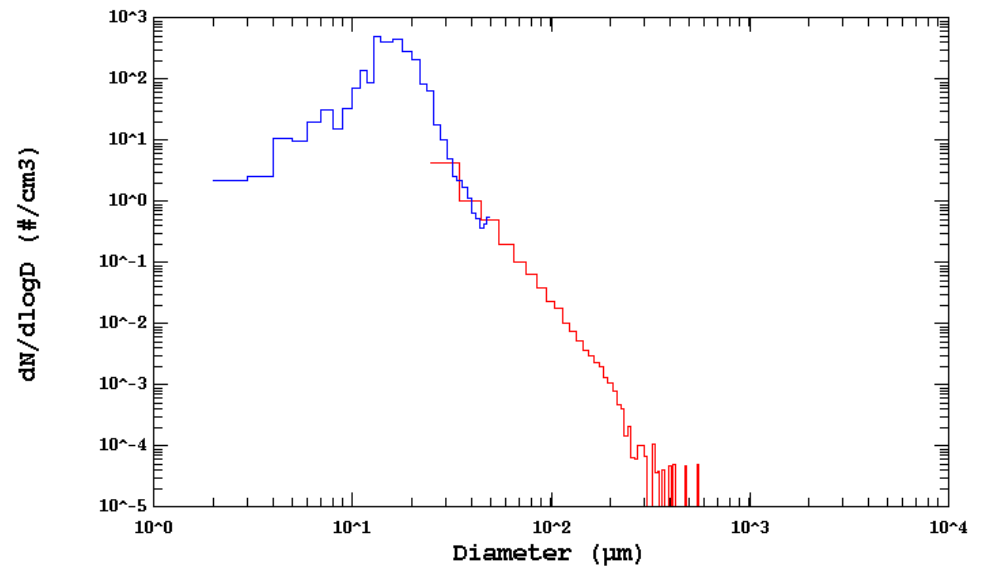
Plotting the data for 7 minutes of ARISTO2016rf06, in marine stratocumulus over the Pacific off Portland, we get the following size distribution of CDP and 2DC10 data. In drizzling marine stratocumulus, one would expect a nice match between CDP and 2DC10, see figure.

There is essentially a "stunning" match between the red and blue size distributions in the overlap region.

Thus alignment was fine on the C-130 (not so cold, but vibrating), and the card itself has adequate time response to make a match between the CDP and the 2DC10 in their overlap region. The time response was much more rigorously determined by Hayman and his summer student, Katie, in the laboratory. Nevertheless, nice to see the observed match.

Thanks to Jim Ranson, Bill Irwin and Mat Hayman for persisting with the alignment of the 2DC10 probe.

ARISTO2016, Flight #rf06
08/16/2016, 20:57:00 - 21:04:00, 420 second average
This plot contains preliminary data



CDP_RWT
2DCA_LPT

Blue curve: CDP probe
Red curve: 2DC10 probe

Data taken over a 7-minute
period flying in marine
stratocumulus off the coast of
Oregon