



Evidence for ice crystal scavenging of light absorbing carbon (LAC) particles

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In April and May, 2007, measurements of light absorbing carbon (LAC) particles were made from the NSF/NCAR HIAPER aircraft between Japan and the United States in air that was being transported eastward from the Asian continent. The purpose of the Pacific Dust Experiment (PacDEX) was to evaluate the properties of aerosol in air masses that originated in Asian and study the transformation of these particles as they aged and interacted with clouds. The LAC was measured with the DMT single particle soot photometer (SP-2) from air sampled with an inlet exposed to ambient air when outside of cloud and from air sample with a counterflow virtual impactor (CVI) when inside cloud. The LAC particles measured from the CVI are those that are on the surface of cloud particles or contained within them.

A comparison of the mass of LAC in particles measured above 8000 m show the following: 1) in the western Pacific, there was more mass of LAC in cloud particles than in the ambient air, 2) the coating of non-light absorbing material is thicker on the LAC in cloud particles than outside of the and 3) the average mass diameter of LAC in cloud particles is larger than outside of the cloud. These three results indicate that LAC particles are being scavenged by cloud particles.

The scavenging of LAC particles by cloud water and ice has important consequences for climate and will be discussed during this presentation.