

## **Entrainment of free troposphere Asian Dust/Pollution into the marine boundary layer North of Hawai`i during INTEX-B**

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During NASA's INTEX-B experiment (April, 2006), regional and global chemical transport models (CTM) successfully predicted two Asian dust/pollution outbreaks. The dusty airmasses were transported from Asia to the Pacific Ocean north of Hawai`i via the free troposphere (FT) and reached locations as far south as the Mauna Loa atmospheric observatory. Five research flights using the NASA DC-8 were flown in order to characterize the long-range transport of trace gases and aerosols from Asia and in order to calibrate/validate both CTM predictions and satellite retrievals.

In-flight mapping of the dust/pollution layers using the NASA Langley DIAL LIDAR show a sloping, subsiding Asian airmass entraining into the marine boundary layer (MBL). Using in-situ measurements of the aerosol size distribution, chemistry, optical properties and the increase in light scattering as a function of relative humidity [f(RH)], we are able to characterize and discriminate between MBL air, FT Asian dust/pollution and an external mixture of the two airmasses during entrainment.

After entrainment aerosols are removed via wet deposition ahead of the trailing low pressure front. The entire episode is put further into context using models, satellite observations and data from the Mauna Loa Observatory. We include a discussion of dust-flux to the ocean surface due to wet-deposition, a potentially important source of iron to the oligotrophic waters of the North Pacific Subtropical Gyre.