Aerosol Dynamics over Bay of Bengal

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Conventionally, the aerosols in the remote Marine Atmospheric Boundary Layer should arise mainly due to sea salt sources produced by the surface winds and continental aerosols carried to long distances. The sea spray aerosol usually occurs in the larger size fractions, while the land-based aerosol has a strong small-particle fraction. Hence the particle size distribution will vary drastically as the air mass is advected over the ocean. The vertical structure of the marine atmospheric surface layers can thus reflect the non-equilibrium conditions prevailing on a given site.

As part of the winter ICARB cruise during Dec2008 -Jan 2009, we measured vertical profiles of size resolved concentration of aerosols over different regions of the Bay of Bengal. Data was collected up to a height of 700 meter with height resolution of 50 m. apart from the spatial variability over different sites, The altitude variation of aerosol number density was found to be steady in the convective boundary layer (up to ~ 400 m) at all locations over BoB and above that the aerosol concentration decreased, except at far eastern BoB. Air mass back trajectories computed for with the vertically resolved aerosol size distribution indicates that while the aerosols advected from IGP have a strong natural (coarse mode) component and those from the east-Asian region are in general accumulation mode (anthropogenic) dominant.