

Development of balloon-borne impactor payload for profiling free tropospheric aerosol size distribution

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Vertical distribution of aerosols in the atmosphere is a key to determine the radiative forcing, assessing size dependent wet deposition, lifetime, and atmospheric stability. Since the vertical distribution of aerosol varies with time and space, accurate in-situ measurements of aerosol size spectrum along with mass concentration in the free troposphere (FT) is important for the climate models and the long-range transport studies. This study presents the development and operation of a customized 6-stage Impactor and its electronic interface for real time balloon-borne measurement of size-segregated (size range: 0.15-5 μm) aerosol mass concentrations in the FT. Data on aerosol size distribution (range: 0.15-5 μm) and mass concentration obtained during the first balloon launch flight in the free troposphere over Hyderabad are presented; the flight took place in the spring of 2016.

Key words: Balloon-borne, Impactor, Troposphere, Aerosol