Workshop on:

"*Aerosol-Climate Interactions: Mechanism, Monitoring, and Impacts in Tropical Regions*"

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Integrated Measurement Techniques for Aerosol Characterization

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Particles, both of natural and anthropogenic origin, affect the climate of the Earth-Atmosphere-System directly by scattering and absorbing solar radiation and indirectly by modifying cloud microphysical properties. Nevertheless, the level of scientific understanding of the direct and indirect forcing by aerosols is classified as "med-low" and "low", respectively by the *Intergovernmental Panel on Climate Change* (IPCC, 2007), as a consequence of the variable nature of aerosols on regional and seasonal scales. Multiple-technique measurements are currently used to assess the aerosol impact on global climate. Long-term continuous observations from satellites, networks of ground-based instruments and dedicated field-measurements in clean and polluted environments are currently used to feed global aerosol and climate models.

Main goal of the talk is to demonstrate the potential capabilities of complementary measurements to retrieve optical and microphysical properties, and the chemical composition of aerosols, in addition to the vertical distribution of the particle number and mass concentration. To this end, results on the aerosol characterization by passive and active remote sensing techniques and in situ observations will be presented. Particular attention will be given to the 29 June – 1 July 2005 dust outbreak occurred over the central-east Mediterranean.