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Lessons learned from the SAMUM–1 and SAMUM–2 field campaigns and future activities

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Two comprehensive field campaigns on desert dust were conducted in 2006 and 2008 in the framework of the **Sa**haran **M**ineral D**u**st Experi**m**ent (SAMUM) project. SAMUM–1 took place in southern Morocco close to the Saharan desert at pure dust conditions in the summer of 2006, whereas SAMUM–2 was conducted in Cape Verde in the outflow region of desert dust and biomass burning smoke from western Africa in the winter of 2008. The relationship between chemical composition, shape morphology, size distribution, and optical effects of the dust particles was investigated. The impact of Saharan dust on radiative transfer and the feedback of radiative effects upon dust emission and aerosol transport were studied. State-of-the-art field observations (ground–based and airborne in situ measurements, multiwavelength polarization Raman and HSRL lidars, Sun photometers with 1640 nm channels, radiometers) and modelling results were compared within a variety of dust closure experiments with a strong focus on vertical profiling of desert dust properties. This presentation summarizes the highlights and main findings of the SAMUM observations and modelling efforts, but also presents a list of remaining problems and unsolved questions.

Another tropical dust experiment is planned for the summer of 2013 and the spring of 2014, the respective proposal was submitted end of 2011 (national funding, DFG). The Saharan Aerosol Long-range Transport and Aerosol-Cloud-Interaction Experiment (SALTRACE) is proposed to take place at Barbados. The research focus is on (a) the transport and transformation (aging, cloud processing, contamination) of African mineral dust and biomass burning smoke in the far field regime (i.e., towards the Americas), about 6000-7000 km west of the main desert dust sources and (b) the impact of aged dust on cloud formation, especially the evolution of deep convection. The motivation, design, and plans of SALTRACE will be briefly outlined.