



Characterisation of Air Flow Conditions during the FEBUKO Hill Cap Cloud Experiments using Non-hydrostatic Atmospheric Models and Tracer Techniques

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The mesoscale and local flow conditions during the ground-based cloud passage experiment FEBUKO performed at the Schmücke Mountain (Thüringer Wald) during October 2001 and 2002 are investigated. Several methods are applied to characterise and classify the cloud episodes in terms of the flow conditions and their consistency to the philosophy of cloud passage experiments. Particular emphasis is placed on the flow over the mountain range and a flow that connects the experimental sites. The resulting selection of events bases on a synoptical evaluation and provides a recommendation of events, which are adequate for subsequent investigations. The mesoscale air flow over the complex terrain is characterised by means of non-dimensional flow parameters like Froude number and the non-hydrostatic meteorological model LM. An analysis of the locally measured natural tracer ozone is intended to assure, that measurements were performed in identical air masses at the different locations during the 14 cloud events. Furthermore, applications of tracer techniques using the inert SF₆ for studies of transport processes in the experimental site and verification of the location of measurement stations are presented. For the tracer experiments in October 2001 and 2002 an attempt is made to reproduce them with an anelastic non-hydrostatic model in conservation form in order to understand the tracer dispersion.