



Nocturnal convective clouds at the eastern Andes of South Ecuador

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Within the DFG research unit 816 diurnal dynamics of cloud development and precipitation behavior are investigated at the eastern Andes of South Ecuador over the last years. During the measurements the occurrence of nocturnal mesoscale convective systems (MCS) south-east of Ecuador in the Peruvian Amazon basin was detected with remote sensing satellite data. It was hypothesized that the formation of these nocturnal convective clouds is a highland-lowland interaction at the foothills of the Andes forming a quasi-concave terrain configuration in this area. The nocturnal katabatic flows from the Andean mountains creating an extensive drainage system, which confluences in the Amazon basin. With sufficient increase in the pressure field due to the special topographical configuration vertical motion is initiated, if sufficient moisture in the atmosphere is available.

In order to verify the hypothesis stated above the numerical model Advanced Regional Prediction System (ARPS) was used. First, the assumed mechanism of nocturnal convective cloud formation was analyzed with idealized case studies. The studies showed the evolution of katabatic flows, their

confluence due to the concave terrain geometry as well as subsequent deep convection. Finally, the knowledge gained was used in a real case study of a chosen nocturnal MCS event at the foothills of the Andes. The poster presents the development of the simulated MCS, which is compared to satellite-observed brightness temperatures from GOES-E imagery. Afterwards, determined characteristics derived from the previous idealized study are used to identify the relevant underlying processes of convective cloud development.