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# Cloud dynamics and their impact on local precipitation processes in a high mountain valley in southern Ecuador detected by satellite and ground-based remote sensing methods

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In the high Andean Mountains of southern Ecuador cloud and rainfall formation processes are strongly connected to the complex structure of the terrain. Due to local small-scale circulation systems such as mountain-valley breezes and luv-lee effects a high variability of rainfalls occur. Besides the thermally-induced convective events in the late afternoon, dynamical processes in interaction with the topography determine cloud and rainfall formation mechanisms.

In the Rio San Francisco valley early morning rainfalls cloud be traced back to nocturnal katabatic-induced mesoscale convective systems (MCS) at the east Andean slopes. A further procedure is expected in a local seeding effect: frequently MCS, formed in the Amazon basin, are transported westward with the easterly trade winds. As a result of the barrier function of the Andes Mountains the lower part of the cloud system rains out at the eastern slopes, while the upper part (cap-cloud) is drifted into the inter-andean valleys. There it acts like a seeder to low stratus clouds (feeder), which occur due to high condensation rates above the canopy.

On the basis of a vertical micro-rain radar (MRR), e.g. radar reflectivity and drop diameter, the seeding effects will be identified. The evaluation of the procedure is carried out with additional observational data: GOES and Nubiscope IR temperatures are employed to detect the appearance of the seeder and the height of the feeder cloud, respectively. The enhancement of the rainfalls are indicated by a disdrometer and in-situ measurements.