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High resolution precipitation climatology for the Andes of South Ecuador

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The climate of Ecuador is strongly dominated by the complex structure of the Andes Mountains. Due to their heights and north-south orientation they act like a barrier, which cause delineation between the western and eastern flanks, as well as the inner-Andean areas. Commonly the Ecuadorian climate is classified in three zones, Costa, Interandina and Oriente. Existing precipitation products such as the GPCC or TRMM data are enabled to represent these climate zones, but because of their spatial resolution, they pass to capture the different regimes within a zone. Especially the inner-Andean region (Interandina) with its characteristic complex terrain shows spatially high climate variability. Local circulation systems, e.g. mountain-valley breezes as well as effects of windward and lee-side, drive the climate conditions allowing for the differentiation of air temperature and rainfall distribution on relative small scales. These highly variable patterns are also reflected by the diversity of ecosystems, e.g. rainforest, dry forest and Paramo, in a relative small area.
In order to represent the local systems a dynamical downscaling approach for the Ecuadorian region is applied. In doing so the Weather Research and Forecasting (WRF) model is used. A suitable model setup was evaluated within a sensitivity study, where various parametrization schemes were tested. The most suitable physics combination was used for a 30 year hint cast simulation.
The poster presents first results of the high resolution climate simulations. On the basis of the spatial distribution of rainfall patterns distinct precipitation regimes within the Interandina will be shown. The aim is to highlight and discuss the importance of the adequately representation of the terrain in mountainous regions like the Andean Mountains.