

Oral.2: **11:00-11:15. Regional climate modeling of the diurnal cycle of precipitation over an equatorial Andean glacier region (Antizana, Ecuador)**

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Abstract

A multi-experiment ensemble is performed using the WRF (Weather Research and Forecasting) model at high spatial resolution (1 km) over the Antizana region (Ecuador) during the year 2005. Our goal is to identify the model configurations that best represent atmospheric processes. The model is able to simulate the complex zonal gradient of precipitation between the wet Amazon and the drier inter-Andean region. The main precipitation biases are (i) an overestimation in the afternoon in the Antizana region related to local surface circulation patterns and (ii) a nighttime overestimation in the Andes-Amazon transition zone associated with the regional circulation. Changing the microphysics scheme and/or the cumulus scheme primarily affect nighttime processes, while changing the topography forcing and activating slope radiation and shading options mostly affects afternoon processes. For this study region and year, our results show that the best configurations require the activation of the cumulus scheme even at 1-km spatial resolutions, which improves the regional nighttime convection induced by the easterly regional flow on the Amazon-Andes transition region. Activating the cumulus scheme instead of using a convection-permitting parameterization also strengthens the daytime upward moisture transport through stronger thermally driven valley winds.