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A study of dust deposition and radiative impacts on the Himalayas for present and future climate, using a regional climate model.

fabien solmon (1), jost von vardenberg (2), vijayakumar s nair (3), marc chiacchio (1), and filippo giorgi (1)

(1) ICTP, Trieste, Italy, (2) ISAC CNR Torino, Itay, (3) Space Physics Laboratory Vikram Sarabhai Space Centre Thiruvananthapuram, Kerala, India

In the context of the PAPRIKA project which aims at studying climate and hydrological change in the Himalayas, we investigate the role of aerosol and especially dust as a potential factor influencing regional climate in this region (through direct atmospheric radiative forcing and modification of snow albedo). We base our study on the use of a regional climate model (RegCM4) which runs over a large domain (CORDEX India) at 50 km resolution and which accounts for emission, transport and removal of dust and other aerosols. A first step of this study is the evaluation of the model and notably its ability to represent the different dust sources, transport and deposition patterns affecting the Himalayas for present day conditions. A number of satellite and in situ measurements are used for this purpose. A second step is to perform a future climate experiment running an ensemble of regional climate simulations under the RCP4.5 scenario and exploring possible future changes of dust emission and deposition patterns and associated radiative forcing on the region.