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Stochastic Precipitation Downscaling with Orographic Corrections

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Few existing stochastic precipitation downscaling methods take into account orography, even if orographic precipitation plays an important role in determining precipitation intensities at small scales, particularly in Alpine areas. In this work we present a modification of the RainFARM stochastic downscaling method (Rebora et al. 2006) in order to take into account orographic effects. The model is calibrated using an orographic signature obtained from a database of 450 pluviometric timeseries in North-Western Italy from 2004 to 2008. An out-of-sample verification is performed on data from 2009. We discuss the limitations and the applicability of this approach to downscaling of climate scenarios.

References:

N. Rebora, L. Ferraris, J. von Hardenberg, A. Provenzale, 2006: RainFARM: Rainfall Downscaling by a Filtered Autoregressive Model. J. Hydrometeorology, 7, 724-738.