



Characteristics of precipitation climatology over the Alps region from a high resolution regional climate simulation

Eun-Soon Im, Filippo Giorgi, Erika Coppola, and Xunqiang Bi
Abdus Salam International Centre for Theoretical Physics, Trieste, Italy

This study investigates the capability of the regional climate model RegCM3 to simulate high-quality surface variables over Europe with a focus on the Alps region. A mosaic-type parameterization of subgrid-scale topography and land use (Sub-BATS) is implemented within the RegCM3 in order to sufficiently capture complicated physiographical feature of high mountain system. The simulation spans a period of fourteen years and 4 months from September 1983 to December 1996 and the boundary conditions are provided from the NCEP reanalysis data. The analysis primarily focus on the daily precipitation statistics in terms of frequency, intensity, extreme, and wet spell and a high-resolution observed daily precipitation (24km) dataset over the Alps region is used for the validation. Overall, the RegCM3 Sub-BATS modeling system is able to reproduce the most prominent patterns of the spatial distribution of monthly and daily precipitation properties over the Alps region. The simulated variability is also in agreement with observation capturing the seasonal characteristics with a maximum in the north for cold season and a maximum in the south for warm season. However, the simulated precipitation tends to overestimate the precipitation frequency while precipitation intensity is underestimated mainly in summer season. This overestimation is more evident in mountain region. Despite some persistent biases, it is expected that the RegCM3 implementing Sub-BATS scheme can be a promising tool for downscaling climate change signal for impact assessment studies over our study region.