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A more in depth analysis of the European Convection Permitting ensemble test case simulations.

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Within the Coordinated Regional Downscaling Experiments Flagship Pilot Studies program (CORDEX-FPS) a convection permitting ensemble of Regional Climate Model (CP-RCM) simulations have been completed over European domain centered on the Alpine regions for three Heavy Precipitation (HP) events of a few days length. Each model for a total of 22 members, from one of the European RCM groups, completed the three case studies in two different modes: the weather like initialization (WL) and the climate mode initialization (CM). For each case study ERA-Interim is used to provide boundary conditions to convection-permitting resolution RCM simulations or to intermediate resolution RCM simulations at 0.22 or 0.11 grid spacing. The latter are in turn used to drive the CP-RCM simulations, which have a resolution of $\sim$2.4-3.0 km.
The three HP events have a different nature and in particular case 1 is a fall HP event driven by the development of MCS over the western Mediterranean basin advecting moist air over three topographically complex regions; case 2 is a summer HP event and case 3 a fall HP event both characterized by orographic precipitation. For the first and second case the results show a tendency to underestimate the peaks precipitation mainly for the CM mode, but a good location of the precipitation maxima is present. In the third case the WL and CM are in very good agreement with the observation for the precipitation intensity and timing.
The role of the internal model variability, the domain boundary and large scale forcing is investigated for the three different synoptic conditions (strongly vs. weakly steered) and local scale interaction (complex topography vs. stronger ocean influence).