

Poster.2: . **Fall Mediterranean Heavy Precipitation Events as seen by a large ensemble of CP-RCM future projections**

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Abstract

The northwestern Mediterranean is affected by Heavy Precipitation Events (HPE), occurring mainly in autumn. With rainfall accumulations greater than 100 mm recorded often within just a few hours, these extreme events lead to devastating flash floods and landslides that may cause widespread destruction and even fatalities. Improving the projection the future evolution of these high-impact weather events is therefore highly policy-relevant.

The rainfall extremes involved in Mediterranean HPE are essentially produced through small-scale to meso-scale convective motions, leading to short-duration precipitation extremes. Convection-Permitting Regional Climate Models (CPRCM) have shown a step-change in the quality of reproducing these short-duration precipitation extremes (Ban et al. 2021) and especially fall Mediterranean HPEs (Caillaud et al. 2021) with respect to lower-resolution climate models. Moreover, this good behavior of CPRCMs allows us to go beyond the basic Eulerian statistical approach and to set up an object-oriented Lagrangian approach in order to explore the spatial and temporal connections that may exist within a given event. The object-oriented approach is applied to the CPRCM ensemble of the CORDEX Flagship Pilot Study on Convection (~15 models). After a model evaluation that demonstrates the ability of the ensemble to represent Mediterranean HPE' characteristics, the same approach is applied to investigate the projected changes at the end of the 21st century.