

**PARALLEL SESSION A : BENEFITS OF DOWNSCALING - A1: ADDED VALUE OF DOWNSCALLING**

**A fine scale topographical modulation of summer precipitation change over the European Alps challenging current GCM projections.**

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We analyze an ensemble of high resolution regional climate model (RCM) projections for the 21st century (RCP8.5 scenario) over the European Alps and find that, while on the broad scale a future reduction of summer precipitation is projected by the driving global models over the region, the RCM ensemble simulates an increase in precipitation over the high elevations of the Alpine chain. This positive precipitation change is due to a fine scale topographical modulation of the change signal induced by an increase in convective rain associated with increased potential instability by high elevation surface heating. This topographic signal is mostly consistent across models and similar across future time slices, and the full change signal is approximately given by the broad scale change (mostly driven by the GCMs) plus this topographical correction (produced by the fine scale RCMs). A similar topographical modulation of the change signal is also found for surface air temperature and precipitation extremes. Our results thus challenge the picture of a decreasing summer precipitation change signal over the Alps found in most GCM projections and point to the role of high resolution RCMs in adding valuable information on future climate projections in areas of complex topography. These conclusions are important for the estimation of impacts over the Alpine region.

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