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# Modifications to severe convective storm ingredients in the Alpine forelands for cases of strong and weak synoptic-scale flow.

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Alpine forelands are well known for the enhanced frequency of severe convective storm occurrence compared to the surrounding areas. It is hypothesized that the mountain induced mesoscale circulations enhance the ingredients for severe convective storms in their proximity. We investigate two severe weather cases, 23 July 2009 and 11 August 2016, when supercells produced damaging hailstorms over the Alpine forelands. Cases differ from each other in the location of the hail producing storms and in the synoptic-scale setting. On 23 July 2009, strong southwesterly flow overlapped with high CAPE over a large area from Switzerland to Poland. As a result, numerous severe convective storms occurred also outside the Alpine forelands. On 11 August 2016, both synoptic-scale flow and CAPE were weaker and severe storms occurred only in a specific part of the Alpine forelands.

We use a nonhydrostatic NWP model COSMO, version 5.04, with 2.8 km horizontal resolution to simulate these cases. The initial and boundary conditions are interpolated from ERA-Interim and ERA-5 reanalysis. This study has two main aims:
1. To investigate the differences in modifications to severe convective storm ingredients over the Alpine forelands in synoptically evident and synoptically quiescent severe weather conditions.
2. To study the differences in the simulations using ERA-Interim and ERA-5 reanalysis in terms of severe convective storm ingredients and simulated storm tracks.

The results should advance our understanding on how mesoscale, mountain-induced, circulations can adjust the severe convective storm ingredients under different synoptic-scale flow regimes.