

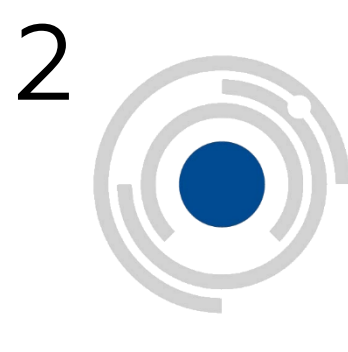
Sensitivity of Supercell Environments to Orographic Modifications



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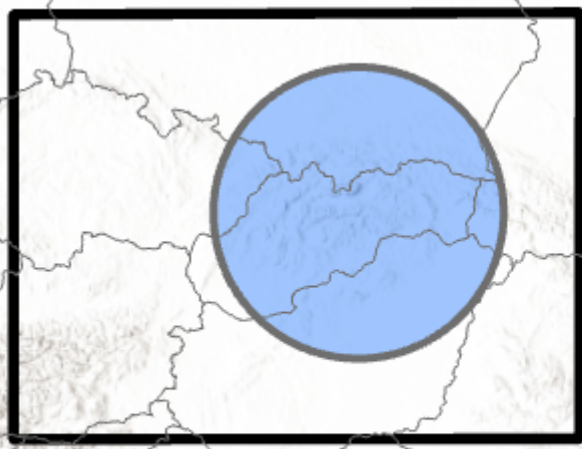


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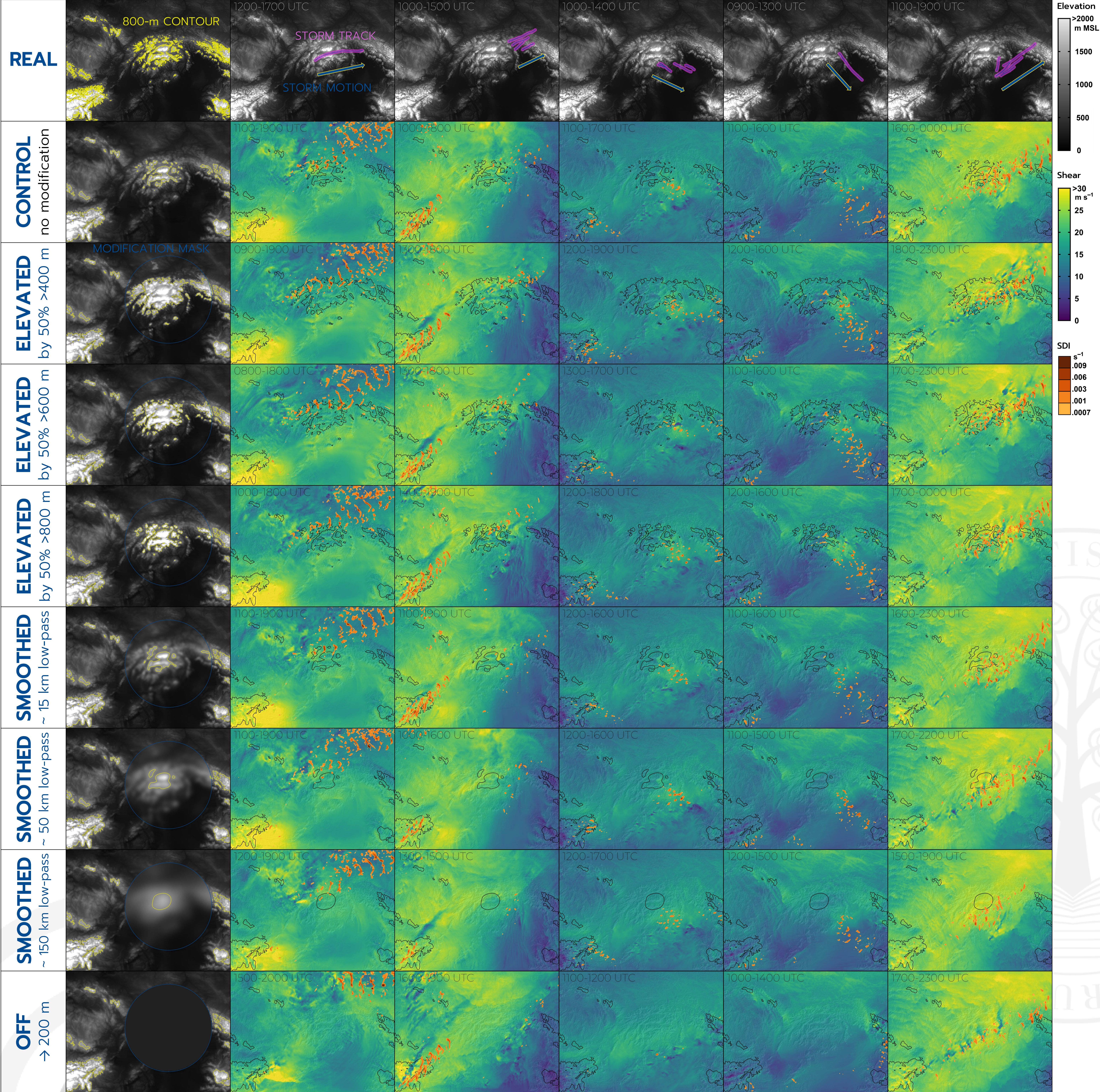
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We present:

- A sample of five days with supercell initiation over the Carpathians, used to investigate **the impact of mountains on storm occurrence and environments** in the COSMO model.
- Storm occurrence analyzed using the **Supercell Detection Index** – SDI (Wicker et al. 2005); key kinematic environment represented by **0–6 km MSL bulk wind shear** evaluated one hour before the first moderate rotating-updraft signal in each region of expected supercell occurrence.
- High-resolution **COSMO simulations** (2.8 km grid spacing) focusing on storm evolution hours with at least a moderate supercell signal (1-h intervals; note the varying time of occurrence), including **seven orographic modifications** where the terrain is altered within a circular mask covering storm-initiation sites (62 storms in total; not shown).



We intend to:

- Expand the dataset by including more supercell days and a wider range of orographic modifications.
- Simulate with 5-min temporal resolution, providing a set of relevant thermodynamic and kinematic parameters.
- Investigate changes in model storm environments, updraft intensity, and tracks across various orographic modifications.

References:

Wicker, L., Kain, J., Weiss, S., Bright, D., 2005: A Brief Description of the Supercell Detection Index. NOAA/NWS Storm Prediction Center, 10 pp. [https://web.archive.org/web/20061013145243/http://www.spc.noaa.gov/exper/Spring_2005/SDI-docs.pdf].