First experience with the ICON NWP model in Czechia

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1/ Introduction

We have successfully implemented the ICON NWP model in Czechia.
In this contribution, we present forecasted precipitation fields including the Lightning Potential Index (LPI) for model runs with 1- and 2-moment cloud microphysics and for a lower and a more detailed horizontal resolution.
Results of forecasts (Fig. 1) are displayed for a thunderstorm that occurred on June 10, 2019, in Czechia, and are compared with observations (Fig. 2, Fig. 3).

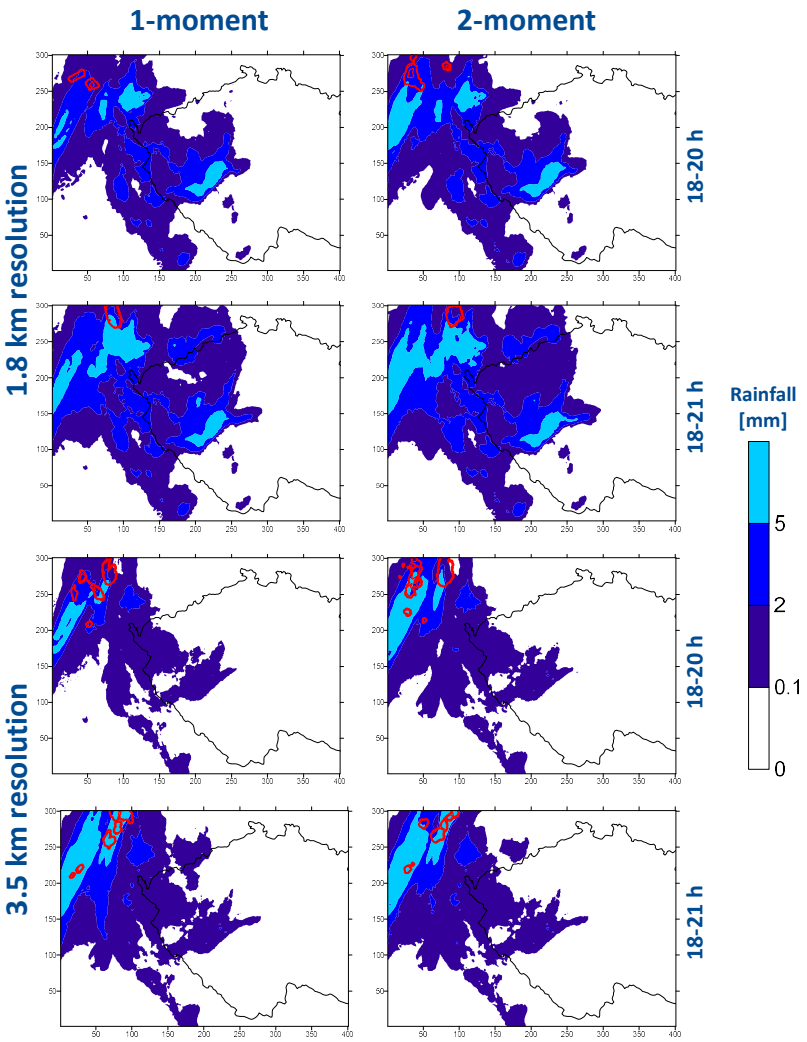

Fig. 1 Accumulated precipitation from 18 to 20 UTC (1st and 3rd row) and from 18 to 21 UTC (2nd and 4th row) based on ICON model runs using 1-moment cloud microphysics (left panels) and 2-moment cloud microphysics (right panels) for a horizontal resolution of 1.8 km (1st and 2nd row) and 3.5 km (3rd and 4th row). LPI > 0.1 is depicted in red.

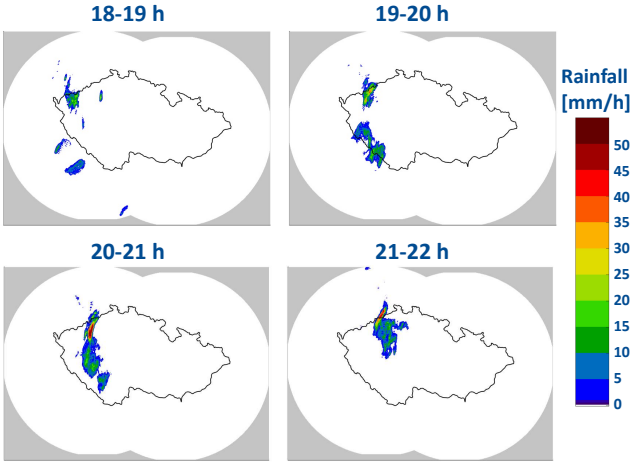

Fig. 2 Spatial distribution of hourly precipitation based on C-band weather radar data over Czechia on June 10, 2019, from 18 to 22 UTC. Weather radar data were obtained from Czech Hydro-meteorological Institute.

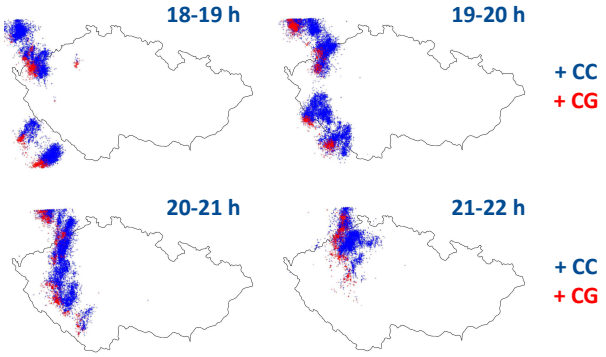

Fig. 3 Number of flashes as observed on June 10, 2019, by EUCLID network from 18 to 22 UTC over Czechia. CC depicts Cloud-to-Cloud lightning, while CG stands for Cloud-to-Ground lightning.

3/ Results and outlook

- Differences in forecasts using 1- and 2-moment cloud microphysics, obvious differences using the two horizontal resolutions
- Forecasted precipitation and LPI fields rather correspond to observations
- ICON tends to give smaller values of LPI as compared to COSMO

We plan to implement Cloud Electrification Model to ICON.

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