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The HARMONIE system: scientific status and challenges

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The HARMONIE system, that is jointly developed by the ALADIN and the HIRLAM consortium, is specifically targetted at the convection permitting scales and can be run with two physics packages, leading to the so-called AROME and ALARO model configurations. The two packages are based on different choices in the physics parameterizations but use a common code for the dynamical core. In this presentation I will give a brief description of the two model configurations and their underlying scientific basis.

Future research is targetted along the following main lines. We aim to increase of resolution aiming to go to one km scale and below. We start to investigate the suitability of the numerics of the spectral dynamical core for the future evolution of the high-performance computing machines. The development of a high-resolution EPS systems to be run at the convection permitting scales has been started. In data assimilation great emphasis is currently being put on the assimilation of radar data since it has been shown that it improves the forecasts at resolutions of about 1 to 2 km.

The HARMONIE system is used across the national meteorological services (NMSs) of the 26 countries participating in the ALADIN an HIRLAM consortia, in many cases with a 3Dvar data assimilation. And it is also used in several mesoscale LAMEPS systems, the most notable ones being GLAMEPS and LAEF. It has been demonstrated that these EPS systems add forecast skill on top of the EPS of the ECMWF.