EMS Annual Meeting Abstracts
Vol. 14, EMS2017-409, 2017

Comparison of radiation parametrizations within HARMONIE-AROME NWP model

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A framework to compare three different atmospheric radiation parametrizations has been built in the HARMONIE-AROME numerical weather prediction system. The schemes are: 1) the default IFSRADIA from ECMWF, based on the IFS cycle 25R1, and the single spectral interval short- and longwave schemes 2) ACRANEB from ALADIN (Masˇek et al. 2016; Geleyn et al. 2017) and 3) HLRADIA from HIRLAM (based on Savijärvi 1990, see also Rontu et al., 2017). Preliminary studies show that the resulting surface downwelling radiation fluxes as well as the convective cloud cover and precipitation are sensitive to the choice of radiation schemes and their calling frequency in the model. Systematic analysis of the sensitivities and model-observation intercomparison will be presented, based on three-dimensional model experiments in summer conditions over a Northern European domain. Surface-based global radiation observations, available over the area, as well as the standard SYNOP and TEMP observations will be used for the validation.

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