

Low stratus (and fog) forecast for Central Europe introducing an empirical enhancement scheme for sub-inversion cloudiness

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Many NWP models still miss the capability of simulating well the development and breaking up of large spread low stratus cover – limited area model ALADIN in the past was concerned with this problem, either.

In order to improve the skill of ALADIN/Austria in handling Stratus situations, an extension to the previous cloudiness parameterization scheme has been developed at ZAMG. It basically consists of two sections, a diagnostic one and a kind of enhancement section, the latter one enters merely at those grid points where Stratus signal has been diagnosed.

The new scheme manipulates low cloudiness in a very selective way which may intensify or at least keep pre-existing inversions through infrared flux divergence inducing cloud-top cooling and heating at lower levels.

There is evidence for significant improvement on Stratus forecast for Central Europe during the latest autumn and winter seasons considering both validations at single locations and the spatial distribution, as well.

Horizontal visibility at ground level as a measure of fog occurrence and density has been postprocessed so far through simple diagnostic relationship, involving inversion strength, quasi-saturated levels as well as 2m values of temperature and dewpoint. Adding prognostic liquid water to Aladin/AUT will allow for a much more physical relationship with horizontal visibility and may hence further improve ground fog forecast for Central Europe.