Comparison between regional re-analysis and NWP forecast for snow

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Snow cover and snow height play an essential role in the surface energy budget, especially during spring with the albedo and during winter with the insulating effect and thermal inertia. Both depend directly or indirectly on the estimation of the snow fraction, which in turn depends on the snow height, vegetation type, orography etc. Therefore several large biases on T2m and other fields in the boundary layer can be explained by deficiencies in the snow scheme and/or snow fall. A necessary step is to evaluate the model snow depth against in-situ observations. However, the "unknown" scale of representativity of the observations often puts the usefulness of this comparison into question especially for the snow depth observations due to the snow transport, north or south face etc ...

In order to improve the overview with more information on the spatial distribution of snow height, the possible use of the high resolution (5.5 km horizontal grid spacing) regional surface re-analysis European UERRA-MESCAN-SURFEX for evaluating the numerical weather prediction (NWP) snow fields (height, density, albedo) will be addressed.

The snow comparison between Meteo-France NWP systems (global model ARPEGE and the non-hydrostatic model AROME) and the MESCAN-SURFEX will be presented with two aspects: the spatial variability over mountainous areas, and features of "long" time series of snow height at various elevations. The French operational system SIM will be used also for the Alps as a "reference". Finally, the potential use of the MESCAN-SURFEX surface re-analysis to validate NWP models surface output will be discussed.