

Interactive comment on “Weather model verification using Sodankylä mast measurements” by M. Kangas et al.

Anonymous Referee #3

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This paper entitled “Weather model verification using Sodankylä mast measurements” is interesting. I have only minor suggestions for improvements.

It describes in a very comprehensive way i) the great potential of the Arctic Research Center of the Finnish Meteorological Institute for evaluating numerical weather prediction models, ii) the verification framework including automatic plotting production developed for evaluating twelve NWP forecasts in a near-real time and on seasonal basis with observations measured in Sodankyla and 7 others instrument sites, iii) a case study of inter-comparison of three radiation schemes in Harmonie-Arome forecast model.

Section 2 describes shortly available Sodankylä measurements. It includes some references (Thum et al. 2009, Aurela et al. 2015) to have more detailed information.

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Section 3 describes very briefly the verification framework. The coordination work performed to evaluate simultaneously several operational NWP on several instrument sites in a near real time and on seasonal basis is really outstanding. We regret that there is no example or illustration in this paper to prove the benefits of near-real time comparison for NWP model verification and for monitoring observations. It could have been also interesting to illustrate how the statistical comparison helps to interpret the errors physically.

Section 4 presents a very brief evaluation of an Harmonie-Arome model configuration (2.5km and 65 vertical levels) with 3 different radiation schemes (IFSRAD, ACRANEB2, HLRADIA). It would be interesting to describe the vertical resolution near the ground and the interpolation algorithm to diagnose screen level variables. The simulated radiative fluxes compare reasonably well with observations. It is found that there is a systematic cold bias on T2m which is not due to radiation fluxes. It is mentioned (not shown) that there is no bias on surface temperature. We regret that the study of this T2m bias is not deepened. It would be for instance very interesting to evaluate the temperature biases at 3, 8, 18, 32m to investigate if the problem is rather in the interpolation method to diagnose T2m or in the physical parameterizations (turbulence scheme most probably).

Page 586 line 16 : the period is 15 January – 15 May 2014, but later the period is shorter from 15 January to 15 March 2014, which is not really a spring period as written several times in the paper.

Page 588 line 2 : the reference system is not described.

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