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Verification of the Eta Model forecasts for wind power generation

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The purpose of this study is to describe how well the Eta Model can be used to validate wind forecasts for the power plants. Verification is made over Scandinavia during the summers of 1996-1999 with total number of verified pairs of about 25750. Nested grid centered on the Nasudden power plants has a horizontal grid spacing of 3.5 km. Twin Eta Model forecasts are made: 1) one with coarse resolution of 22 km; and 2) another one with nested grid. Coarse resolution forecast used for boundary conditions of nested grid model. Verification is made for the nested grid model only.

The wind at 10 m level obtained from the Eta Model and the same observed from the wind turbine tower are compared first to the observed wind from the nearest surface observations at Visby. Also, the 10 m wind from the Eta Model is compared to the wind observed from the wind turbine tower at the same level. Then at higher levels the Eta Model wind is compared against to the wind from the tower observations at particular levels (10, 38, 54, 75 and 96 m).

Four common measures of accuracy - mean error (bias), mean absolute error, root mean square error and correlation coefficient, are used. Average over-all summary results of the Eta model accuracy respectively are: 0.98 m/s, 1.47 m/s, 1.80 m/s and 0.78 for the surface-layer, and 0.45 m/s; 1.40 m/s; 1.75 m/s and 0.80 for the vertical levels.