



Resolution Evaluation of the WRF Model with WAsP comparisons for the Short Term Wind Energy Prediction System of Turkey

Nur Goktepe (1), Erkan Yilmaz (2), Fahri Mert Sayinta (3), Emel Unal (4), Elcin Tan (5), Yurdanur Sezginer Unal (6), Sukran Sibel Mentes (7), and Selahattin Incecik (8)

(1) Department of Meteorological Engineering, Istanbul Technical University, Istanbul, Turkey (goktepenur@gmail.com), (2) Department of Meteorological Engineering, Istanbul Technical University, Istanbul, Turkey (erkanyi12@gmail.com), (3) Department of Meteorological Engineering, Istanbul Technical University, Istanbul, Turkey (sayintamert@gmail.com), (4) Department of Meteorological Engineering, Istanbul Technical University, Istanbul, Turkey (unaleme@gmail.com), (5) Department of Meteorological Engineering, Istanbul Technical University, Istanbul, Turkey (elcintan@gmail.com), (6) Department of Meteorological Engineering, Istanbul Technical University, Istanbul, Turkey (sunal@itu.edu.tr), (7) Department of Meteorological Engineering, Istanbul Technical University, Istanbul, Turkey (smentes@itu.edu.tr), (8) Department of Meteorological Engineering, Istanbul Technical University, Istanbul, Turkey (incecik@itu.edu.tr)

Resolution Evaluation of the WRF Model with WAsP comparisons for the Short Term Wind Energy Prediction System of Turkey

Nur Goktepe, Erkan Yilmaz, F. Mert Sayinta, Emel Unal, Elcin Tan, Yurdanur Sezginer Unal, S. Sibel Mentes, and Selahattin Incecik

Istanbul Technical University, Department of Meteorological Engineering, Maslak 34469 Istanbul Turkey

Since Turkey has high wind energy potential, the sector has grown rapidly and it has become more competitive in predicting accurate wind power with new regulations of wind energy production of the country. Our recent studies show that in order to improve the reliability of wind power prediction, the usage of a numerical weather prediction model is inevitable due to the chaotic behavior of the atmosphere. Therefore our research group has developed a short-term wind energy prediction system (SWEPS) for Turkey by using a hybrid approach, which includes a numerical weather prediction model (WRF), a physical model (WAsP), and a model output statistics method. In this study, we present only the coupled wind power prediction results of the WRF and WAsP models up to 72hr by comparing the horizontal domain resolutions of the WRF Model, which are 9km, 3km, and 1km. We studied Intepe wind farm where is located in the northwestern part of Turkey. We performed 72 hourly simulations consecutively for the whole year of 2010. We compared 38 wind turbine power observations of this wind farm with the modeled wind power values obtained by the WRF and WAsP coupled system by means of root mean square error (RMSE). Our results show that RMSE of the coupled model may vary depending upon both wind speed and the resolution of the WRF model especially related with the season.