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A Comparison Of Primitive Model Results Of The Short Term Wind Energy Prediction System (Sweps): WRF vs MM5

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Although discontinuous behavior of wind field makes energy production more difficult, wind energy is the fastest growing renewable energy sector in Turkey which is the 6th largest electricity market in Europe. Short-term prediction systems, which capture the dynamical and statistical nature of the wind field in spatial and time scales, need to be advanced in order to increase the wind power prediction accuracy by using appropriate numerical weather forecast models. Therefore, in this study, performances of the next generation mesoscale Numerical Weather Forecasting model, WRF, and The Fifth-Generation NCAR/Penn State Mesoscale Model, MM5, have been compared for the Western Part of Turkey. MM5 has been widely used by Turkish State Meteorological Service from which MM5 results were also obtained. Two wind farms of the West Turkey have been analyzed for the model comparisons by using two different model domain structures. Each model domain has been constructed by 3 nested domains downscaling from 9km to 1km resolution by the ratio of 3. Since WRF and MM5 models have no exactly common boundary layer, cumulus, and microphysics schemes, the similar physics schemes have been chosen for these two models in order to have reasonable comparisons. The preliminary results show us that, depending on the location of the wind farms, MM5 wind speed RMSE values are 1 to 2 m/s greater than that of WRF values. Since 1 to 2 m/s errors can be amplified when wind speed is converted to wind power; it is decided that the WRF model results are going to be used for the rest of the project.