Sensitivity evaluation of PBL and LSM parameterization for mesoscale model WRF over the Korean Peninsula

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The numerical model is sensitive to planetary boundary layer (PBL) and land surface model (LSM) at low level wind field. The choice of PBL and LSM parameterizations is important for numerical model to establish wind resource studies. The performance of Weather Reasurch and Forecasting (WRF) model (version 3.1.1) is evaluated using different PBL and LSM parameterizations and validated with wind speed and direction at 10m and 80m above ground level over the Korean Peninsula during 4-6 March 2007, 4-6 August 2008, 19-21 November 2007 and 7-9 January 2009.

WRF model has conducted on a nested grid from 27 km down to 1 km horizontal resolution as 4 domains. First of all, a high resolution topography with a 100-m resolution from SRTM and 30-m land-use from LandSat satellite is remapped on WRF model. Statistical verification scores such as bias, RMSE, RMSVE show better results by improvement of bottom boundary condition. This study used some PBL and LSM. PBL consist of YSU, Mellor-Yamada-Janjic (MYJ), Pleim (ACM2) and LSM consist of Noah, Rapid Update Cycle (RUC), Pleim. Although model performance varies according to the weather condition by using different PBL and LSM, experiment with MYJ and RUC represents the best result for lower atmosphere wind speed and the all of the PBL and LSM parameterizations simulated similar on wind directions. The performance of temperature and water vapor at lower level would be presented in the conference.