수치모델링으로 구축된 바람지도를 이용한 한반도 풍력자원평가

정 주희[1], 김 유근[2], 권 지혜[3]

Evaluation of Wind Resources in Korea
using Wind Map based on the Numerical Modeling

Ju-Hee Jeong, Yoo-Keun Kim, Ji-Hye Kwun

Key words : Wind map, Numerical modeling, MM5, LAPS, PBL schemes, Evaluation, Wind resources

Abstract : For the elaborate analysis of wind resources according to the detailed grid information in Korea, the wind map with systematic grid informations constructed by the numerical modeling was designed to evaluate wind resources. The accuracy of modeling is the matter of the proper physics options and the good initial conditions. Therefore, two steps of experiments were conducted in this study. First step is about the PBL schemes which affects wind fields significantly. MRF, Eta, Blackadar and Gayno-Seaman were used to verify the best schemes with great performances simulating winds in PBL. The results showed the Eta scheme was optimal for the wind simulations with the lowest RMSE of 1.53 and the highest IOA of 0.66. Second step is to improve the initial conditions of the model. LAPS data assimilation system was used to solve this problem. The observations including AWS, ASOS, GTS, AMEDAS, wind profiler and QuikSCAT were utilized to enhance the initial conditions. The statistical analysis indicated that LAPS using those observations above contributed to the reduction of producing improper results from numerical modeling, by showing RMSE of 1.34 and IOA of 0.73. The detailed assessments were performed based on wind map using numerical modeling which is conducted for one representative case per a month showing seasonal characteristics in 2005. The strong magnitude of wind speed was shown from the southwest coastal regions to the southeastern areas including South Sea. The distributions of wind speed class consisting of 7 classes which is considering the topographical features in Korea suggested the detailed information with grid system of wind resources. The eastern coastal areas along Taebaecksanmack, regions nearby Jiri mountain and Gaji mountain and South Sea from the southwestern to southeastern sea are evaluated to be have the most abundant wind resources in Korea with class 5 or greater.

1) 부산대학교 대기과학과
   E-mail : jeongjuhee@pusan.ac.kr
   Tel : (051)583-2652 Fax : (051)515-1689
2) 부산대학교 대기과학과
   E-mail : kimyk@pusan.ac.kr
   Tel : (051)510-2282 Fax : (051)515-1689
3) 부산대학교 대기과학과
   E-mail : jhkwun@naver.com
   Tel : (051)583-2652 Fax : (051)515-1689