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## Retrieval of Humidity Profile Using Refractive Index of UHF Wind Profiler Radar

Min Seong Kim<sup>1</sup>, Byung Hyuk Kwon<sup>2</sup>, Sangjin Kim<sup>1</sup>, KyungHun Lee<sup>1</sup>, and Yujin Kim<sup>1</sup>

<sup>1</sup>Pukyong National University, Division of Earth Environmental System Science, Korea, Republic of

<sup>2</sup>Pukyong National University, Department of Environmental Atmospheric Sciences, Korea, Republic of

In the atmospheric boundary layer (ABL), the humidity profile was retrieved by combining the data of the radiometer and the wind profiler, and was compared with that of the GPS radiosonde. The variation of the amount of precipitable water (PW) was analyzed in sea breeze, typhoon, and precipitation cases. High-frequency electromagnetic waves emitted from the wind profiler are affected by atmospheric thermodynamic factors (temperature, humidity, and atmospheric pressure). An algorithm was developed to determine the optimal vertical gradient of refractivity (M) which plays important role in the vertical variation of humidity. M was corrected in consideration of the boundary layer height estimated by the wind profiler and the humidity characteristics in the mixed layer. The root mean square error (RMSE) of the retrieved specific humidity was 1.72 g/kg, which was twice as low as the RMSE 3.42 g/kg of radiometer specific humidity. The variation of PW is essential for understanding the structure of the ABL. As the sea breeze blows, the PW increased in the lower layer. As the typhoon approaches the Korean Peninsula, the lower level PW increased rapidly. The PW before and after precipitation showed clear increase and decrease, respectively except for summer season when there is enough water vapor