

# Quality assessment of VVP winds from Indian Doppler weather radars: a data assimilation perspective

Devajyoti Dutta, Amar Jyothi Kasimahanthi, Swapan Mallick, John P. George,  
and Preveen Kumar Devarajan

Journal of applied remote sensing, 11(3), 036021

**Abstract:** This study demonstrates the data assimilation perspective of vertical profiles of winds derived from the Doppler weather radar (DWR) data using the volume velocity processing (VVP) technique. The VVP information from the nine Indian DWR stations is used in this study. The winds from the Indian DWR network are assessed for their quality based on the National Center for Medium Range Weather Forecasting unified model (NCUM). This paper describes the quality of DWR VVP winds, preprocessing of VVP wind data, and their use in NCUM 4 D-Var assimilation systems. The VVP winds are compared against an NCUM background (short forecast) to understand the observation bias. Comparison of VVP winds is also made with colocated radiosonde wind observations. The VVP winds show less bias when compared against model background especially in the region of strong wind flow. The correlation between the observations and the model background is greater than 0.7 for most of the radars. The VVP winds provide reasonably accurate estimates of the vertical wind structure in the troposphere over radar locations, which can be effectively used in the numerical weather prediction system.

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