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An Investigation of the Single-Doppler Wind Retrieval Technique Using TAMEX IOP#2 data

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The moving frame of reference technique is a method that retrieves wind field from single-Doppler radar observed radial wind and reflectivity. In this paper, this technique is developed to retrieve three dimension wind field. The performance of this method is explored using idealized data sets generated from a numerical model. Several factors which may affect retrieval results have been tested. These factors include: the distance between the radar site to the area of interest; the scanning strategy; as well as the moving speed of the weather system. The results show that three-dimensional wind field can be retrieved accurately from single-Doppler radar observed radial wind and reflectivity simulated by numerical model. Especially, there is high correlation between the retrieved vertical flow structure and its true counterpart. This result is particularly encouraging. This single-Doppler retrieved scheme is also investigated using filed experimental data observed during the Taiwan Area Mesoscale Experiment (TAMEX) intensive observation period (IOP) 2 . TAMEX IOP#2 took place on 16-17 May 1987 and it is a particular case represented a long-lasting subtropical squall line. This scheme can retrieve the 3-D wind structure of squall line from real radar observations perfectly.