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Impact of Doppler Velocities Assimilation on the Initialization and Simulation of Three Different Precipitation Systems

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Doppler radar has the capability of remotely observing the internal structure of precipitation weather systems at high spatial and temporal resolution. Doppler velocities from Taiwan Doppler weather radar data are assimilated into MM5 using the NCAR 3DVar system for three severe precipitation systems, include hailstorm, typhoon and Maiyu front case. The increments of the maximum wind speed are about 10-20 m/s in these cases by assimilating radial velocity. The assimilation of radial velocity could adjust the wind pattern to the beneficial mesoscale wind fields and induced the mesoscale precipitation. In the Meiyu front case, the horizontal wind shear could be revised when mesoscale model could not simulate the pattern in the short time forecast. By the cycling process of assimilation, Typhoon Aere Could increased the intensity and more correct distribution of rainfall in Taiwan area when Typhoon near Taiwan terrain and its location has little shift. We will discuss the impact of radar radial velocities on the data assimilation and simulation. A series of experiments will be performed and the result will be discussed in this study.