

# The Impact of Atmospheric Motion Vectors from CMA, JMA and KMA on the Tropical Cyclone Track Forecasts

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The northwest Pacific Ocean is the most frequent sea where tropical cyclones take place. The application of a series of unconventional high resolution spatiotemporal data, Atmospheric Motion Vectors (AMV), complements the defect of observational data above the sea. It is noted that the assimilation of AMV in models can effectively improve the typhoon track forecast.

This study includes the impact of AMV from FY-2C by CMA and from MTSAT-1R by JMA and KMA on the track of tropical cyclone forecasting in the WRF 3DVAR.

The 3DVAR assimilation of the AMV for 48-h forecast period is carried out on a single domain with 30-km a horizontal resolution and a 6-h assimilation window for every 3h. Incorporation of 3 kinds of AMV was found to yield reduction in forecast mean error. The results are as follows:

1. In the experiment of the typhoon Khanun(200515), the mean error of typhoon track forecasts on the control experiment and CMA' AMV assimilation was 130km, 105km, respectively. The mean error of AMV assimilation was reduced about 19% more than that of control experiment.
2. In the experiment of the typhoon Nabi(200514), the mean error of typhoon track forecasts on the control experiment and JMA' AMV assimilation was 208km, 150km, respectively. The mean error of AMV assimilation was reduced about 28% more than that of control experiment.
3. In the experiment of the typhoon Sinlaku(200813), the mean error of typhoon track forecasts on the control experiment and KMA' AMV assimilation was 156km, 100km, respectively. The mean error of AMV assimilation was reduced about 36% more than that of control experiment.