Design and development of surface rainfall forecast products on GRAPES_MESO model

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In this paper, we designed and developed the surface rainfall forecast products using medium scale GRAPES_MESO model precipitation forecast products. The horizontal resolution of GRAPES_MESO model is 10km*10km, the number of Grids points is 751*501, vertical levels is 26, the range is 70ºE－145.15ºE, 15ºN－64.35 ºN.

We divided the basin into 7 major watersheds. Each watersheds was divided into a number of sub regions. There were 95 sub regions in all. Tyson polygon method is adopted in the calculation of surface rainfall. We used 24 hours forecast precipitation data of GRAPES_MESO model to calculate the surface rainfall. According to the site of information and boundary information of the 95 sub regions, the forecast surface rainfall of each sub regions was calculated. We can provide real-time surface rainfall forecast products every day.

We used the method of fuzzy evaluation to carry out a preliminary test and verify about the surface rainfall forecast product. Results shows that the fuzzy score of heavy rain, rainstorm and downpour level forecast rainfall were higher, the fuzzy score of light rain level was lower. The forecast effect of heavy rain, rainstorm and downpour level surface rainfall were better. The rate of missing and empty forecast of light rainfall level surface rainfall were higher, so it's fuzzy score were lower.