13.56 SHORT TIME PRECIPITATION ESTIMATION USING WEATHER RADAR AND SURFACE OBSERVATIONS: WITH WIND DRIFT INTEGRATED USING A STOCHASTIC METHOD

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C-band radar, which is widely used in Europe, measures instantaneous precipitation rate every 5 minutes, and the rainfall is accumulated based on the 5-min spaced radar maps. It is a frequently seen phenomenon that two consecutive radar maps have horizontal displacement in the pattern due to the horizontal component of the wind. In this paper a method of downscaling radar rainfall accumulation is proposed, where the horizontal displacement of the wind is integrated using a stochastic method, and the radar rainfall is downscaled spatially and temporally. Estimation of short time precipitation with reasonable accuracy is essential in flash flood now-casting. Weather radar, with its virtue of giving the spatial distribution of the rainfall, is combined with rain-gauge observations, which are considered as "ground truth", interspersed within the area of interest. It is common practice to compare gauge data with the collocated radar data directly, by assuming the vertical descending of the hydrometeors, which is not true in many cases. Hydrometeors are very likely to be displaced by wind during the descending from the radar measurement height and the Earths surface, i.e. the effect of wind drift. In this paper, the effect of wind drift is investigated and integrated in the radar-gauge combination scheme in a stochastic manner. The proposed combination method is powerful in giving short time precipitation estimation, which honors both the spatial distribution of the rainfall indicated by weather radar and the "ground truth" given by the rain-gauge observations. Examples are given to show the applicability and the robustness of the method.