

AN ALGORITHM FOR PROJECTING RADAR RAINFALL RATE

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Consecutive images of weather (WSR-88D) radar are used to project rainfall rate one or two hours in advance. The algorithm starts for identifying the rainy cloud cells and determines the cloud motion vector in each cell. The motion vector is interpolated over the entered rainfall area. Since radar reflectivity varies in time and space the radar covered area is divided into smaller regions to properly represent the spatial variability. The potential predictors are the previous observations of reflectivity located in a neighborhood region with center on a projected pixel. The cloud motion vector (direction and speed) is used to determine which pixels advected the cloud cell; and therefore, they should be activated as potential predictors. The advected pixels are extracted from the previous two radar images for each region. The forward selection algorithm is used to eliminate irrelevant pixels and determine the best predictors for each region. In addition, the vector motion is also used to advect the rainy pixels and determine which pixels will be included and which will be eliminated from the convective cell. Finally, the rainfall potential is computed after evaluating the identified empirical models over the persistence and advected rainy pixels. The proposed algorithm can be used to couple with a hydrological numerical model to estimate flooding events. Although, radar reflectivity is used to illustrate the algorithm, an extension to satellite rainfall rate is a straightforward implementation.