

Validation of Algorithm for the Identification and Tracking of Convective Cell (AITCC)

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A new method for identifying and tracking convective cells is proposed for the statistical analysis of convective cells embedded within mesoscale convective systems using two-dimensional radar reflectivity dataset. The Algorithm for the Identification and Tracking Convective Cells combines the constant and adaptive threshold methods with a new cell-merging and -splitting scheme, and is termed AITCC. The scheme assumes the

conservation of total area and the relative locations of cells when merging or splitting occur. The performance of AITCC in tracking was evaluated in an analysis of 2004 non-severe convective cells (30-40 dBZ) and in 1268 cell assignments observed within meso- β convective systems in the Meiyu frontal region. We demonstrated that the use of the new cell-merging and -splitting schemes significantly decreased the number of incorrect cell assignments especially in situations where convective cells are located close together.

AITCC showed a promising performance (false-alarm-rate < 10%) in tracking of weak convective cells (30-40 dBZ) that seemed to be difficult for the previous tracking algorithms. AITCC is expected to enable to calculate the statistical features of convective cells from their development to dissipation.

Keywords: Convective cell, cell-tracking