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Analysis of atmospheric motion vector tracking process

Yurim Oh(1), Jae Hwan Kim(1), Tae-Myung Kim(2), Hyungmin Park(1), Daegeun Shin(1)

(1)Pusan National University,
(2)National Meteorological Satellite Center/KMA

A study of tracking process for developing the atmospheric motion vector (AMV) algorithm for COMS (Communication, Ocean, and Meteorological Satellite) MI (Meteorological Imager) is described. The typical way of AMV displacement is derived by tracking clouds or water vapor features in consecutive geostationary satellite images by assuming that cloud moves at a constant level and does change shape over time interval of an image sequence. To analyze and improve traditional tracking process, we have tested the coldest cluster within a reference target because features are appeared to be less deformed in a short-term image sequence. In this study, we have adapted Gaussian Mixture Model to extract the coldest cluster, adjusted target size and transformed target image. In selecting target image, we have performed image filtering based on that cloud pixels of highest cloud layer, which is assumed to be core, provide higher weight than cloud edge and clear pixels. The filtered target image in reference time is then used for the tracking. The comparison shows some improvement of our filter method over the operational COMS AMV. This approach may improve the current problems in tracking AMV.