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AMV Derivation Scheme for FY2 Meteorological Satellite

Summary and purpose of paper

This paper introduces the current work about cloud motion vectors in CMA.

AMV Derivation Scheme for FY2 Meteorological Satellite

Xu Jianmin Zhang Qisong Fang Xiang Lu Feng
Rong Zhiguo Zhang Yuxiang Luo Jinning Shi Chuenxiang
Liu Jian Zhang Xiaohu Wang Sujuang

National Satellite Meteorological Center
China Meteorological Administration, Beijing 100081 China, E-mail:
xujianmn@public.bta.net.cn

FY2 satellite AMV derivation scheme is developed based on NSMC's AMV derivation scheme for GMS5.

In order to derive wind products for FY2, the following work are performed:

1) Image Navigation of FY2 is improved. An automatic image navigation algorism is realized. Navigation accuracy for FY2 images reaches pixel level.

2) Calibration of FY2 is improved. Inter calibrations between FY2 and NOAA observations are performed. Infrared and water vapor channel calibration are improved and compatible with NOAA observations.

3) Height assignment procedure is improved. Opaque cloud radiation is calculated with NWP data by using radiation model. Original assumption on same IR and WV brightness temperature for opaque cloud is removed.

4) Quality indexes are calculated with CMA's numerical prediction model output.

The major characteristics of the previous scheme are reserved. They include:

5) A stepwise search procedure is adopted. Search area does not rely on NWP results.

6) The absolute maximum and secondary peaks (if present) at two successive image pairs are used to identify potential displacement vectors.

7) Sub-pixel optimization is made in search procedure.

8) In height assignment component, distinction between high and low clouds is made before height adjustment by correlation between the IR and WV matching templates.

9) Quality control is an integral part of the processing. Time consistency examination is performed immediately after tracer tracking; horizontal consistency examination and height adjustment are performed immediately after height assignment. Tracers failed in the examinations are eliminated.

The following work are undertaken:

10) Cloud cluster analysis of FY2 will be made and image filtering will be introduced.

11) BURF coding will be produced.