**FY-2 On-orbit Operational Calibration Approach (CIBLE) and its Benefit to FY-2D/E AMV Products**

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Abstract

Before 2012, the on-orbit operational calibration methods of FY-2 satellites were dominated by cross-calibration with the wide-band sensors AVHRR/HIRS or the high spectral resolution ones IASI/AIRS recommended by GISCS. During the last several years, the self-developed calibration of inner blackbody corrected by lunar emission (CIBLE) has been established and operationally working in FY-2F/E/D satellites in Jul.21, 2012, Mar.27, 2013 and May 21, 2013, respectively. The two kernels of CIBLE include lunar calibration and inner blackbody calibration. It is indicated that, the difficult problem of how to precisely calibrate the radiometric response varying frequently with the environmental thermal field for infrared bands for FY-2 satellite has been solved by CIBLE, which has been considered as the most important technical breakthrough in calibration society for geostationary meteorological satellite in China.

Compared with the synchronous observations of MTSAT-2 in the cold temperature region of below 230K, the calibration biases of CIBLE for FY-2D/E/F satellites have been convinced to be about 1-2K@220K. The real-time CIBLE results could be achieved in both the NOM files through website and the S-VISSR date stream with only 2 minutes delay from the beginning of observation. By using the latest CIBLE outcomes, the performances of the typical quantitative product, atmospheric motion vector (AMV) has also been greatly improved. Particularly, it is validated by ECMWF that the RMSE of WV-AMV for FY-2E satellite remains 4-5 m/s and the bias of IR-AMV for FY-2D satellite has been decreased by about 1.5 m/s after using CIBLE approaches.