

**Citation:** Tan, Z. H., S. Ma, X. B. Zhao, et al., 2019: Evaluation of cloud top height retrievals from China's next-generation geostationary meteorological satellite FY-4A. *J. Meteor. Res.*, 33(3), 553–562, doi: 10.1007/s13351-019-8123-0.

**英文题目:** Evaluation of Cloud Top Height Retrieval for China's Next-generation Geostationary Meteorological FY-4A Satellite

**作者:** TAN Zhonghui, MA Shuo\*, ZHAO Xianbin, YAN Wei et al.

**英文摘要:** To evaluate the validity of cloud top height (CTH) retrievals from FY-4A, the first of China's next-generation geostationary meteorological satellite series, its retrievals are compared to those from Himawari-8, CloudSat, CALIPSO (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations) and MODIS (the Moderate Resolution Imaging Spectroradiometer) operational products using data from August through October 2017. Regarding CTHs from CloudSat, CALIPSO and MODIS to be truth, the results show that the performance of FY-4A CTH retrievals is similar to Himawari-8. Both FY-4A and Himawari-8 retrieve reasonable CTH values for single-layer clouds, but perform poorly for multi-layer clouds. The mean bias error (MBE) shows that the mean value of FY-4A CTH retrievals is smaller than Himawari-8 for single-layer clouds but larger for multi-layer clouds. For ice crystal clouds, FY-4A as well as Himawari-8 obtain underestimated CTHs. However, there is a tendency for FY-4A and Himawari-8 to overestimate the CTH values of CloudSat and CALIPSO mainly for low level liquid water clouds. The temperature inversion near the tops of water clouds may result in an overestimation of CTHs. According to the MBE change with altitude, FY-4A and Himawari-8 overestimate the CTHs mainly for clouds below 3km, and the overestimation is slightly more apparent in Himawari-8 data than in FY-4A values. As the cloud optical thickness increases, the CTH bias of FY-4A CTH retrievals gradually decreases. Two typical cases illustrate in detail the differences between different satellites' CTH retrievals.

**中文题目:** 新一代静止气象卫星 FY-4A 云顶高度产品的对比研究

**作者:** 谭仲辉, 马烁\*, 赵现斌, 严卫, 等。

**中文摘要:** 为准确评估我国新一代静止气象卫星 FY-4A 反演云顶高度的有效性, 分别以 CloudSat、CALIPSO 和 MODIS 探测结果为基准, 对 2017 年 8 月至 10 月的 FY-4A 和 Himawari-8 云顶高度反演结果进行定量对比研究。结果表明: FY-4A 反演云顶高度质量与 Himawari-8 基本相当。FY-4A 和 Himawari-8 对单层的反演结果较好, 而多层云情况下反演误差较大。云顶高度的平均偏差表明: 单层云时 FY-4A 云顶高度的平均值小于 Himawari-8, 但在多层云时却大于 Himawari-8。对冰云反演时, FY-4A 和 Himawari-8 的云顶高度偏小, 而对水云反演时, 云顶的逆温会造成对云顶高度的高估。根据云顶高度平均偏差随高度的变化, FY-4A 和 Himawari-8 对云顶高度的高估现象主要针对高度在 3km 以下的云, 并且 Himawari-8 的高估误差相对 FY-4A 较大。随着云光学厚度的增加, FY-4A 和 Himawari-8 的云顶高度的平均偏差都逐渐减小, 且 FY-4A 的反演偏差普遍小于 Himawari-8。对两个典型个例的分析展现了不同卫星云顶高度反演结果在更多细节上的差异。

文章结构框图:

