



Analysis of convective clouds characteristics by FY-4A data

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Short-term convective weather nowcasting remains a problem for operational weather forecasting though there are several methods, such as radar, NWP model to do it. Geostationary satellite that has its own shortcomings is still a kind of valuable assets for addressing the convective initiation nowcasting problem.

FY-4A is the first satellite of the second generation geostationary satellites in China. The payloads of FY-4A include advanced geosynchronous radiation imager (AGRI), geo. Interferometric infrared sounder (GIIRS), lightning mapping image (LMI) and space environment package (SEP). The number of channels of scanning radiation imager onboard the FY-4A hits 14. The highest spatial resolution gets 500 meters. FY-4A with improved remote sensing ability will play an important role in convective cloud analysis.

The study use FY-4A AGRI data with about 5 minute temporal resolution to analyze the characteristics of convective clouds. The changes of cloud parameters, such as cloud top temperature (CTT), cloud particle phase (CLP) and cloud optical thickness (COT) are used to analysis the convective cloud development. The GIIRS data was helped to diagnose the atmospheric status in convective environment. The analysis results show that cold cloud top is the main properties to produce strong precipitation during strong convective cloud process. When heavy precipitation appears on the surface, cloud not only has colder top temperature, but also the colder cloud top should maintain a certain time period. The change of COT and CLP can be used together with CTT to increase the probability of convective cloud detection.