[EE] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-CG Complex & General

[A-CG36]Satellite Earth Environment Observation

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In recent years, we cannot avoid facing issues on global environmental changes that occur in various spatiotemporal scales. The earth environmental observation data by satellites became the necessary basic data to tackle and solve those issues. Due to the recent advancement in the observation sensor technique and the data processing technique, the satellite observation has been showing rapid progress, and the time is changing from examining the accuracy of the observation sensor data to the advancement of the data application, leading to broaden potential users. In these days application became synergetic, so we comprehensively pick
up this topic in the Atmospheric and Hydrospheric Sciences Session of this Union Meeting that enables to comprise the atmospheric, oceanic and land sciences; by combining the intelligence and the knowledge of the party, we propose a session that aims to prompt further studies towards the issues on earth environmental change, the advancement in the data application and future plans of Earth Observation missions.

[ACG36-P03]Influence of the aerosol under the cloud layer on calculation of the shortwave radiation flux in China from Himawari-8/AHI satellite measurement

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In this study, shortwave radiation flux simulated from Himawari-8 satellite products is compared to ground-based observations in Xianghe site of China. In clear and cloudy sky with clean atmospheric conditions, the shortwave radiation fluxes using satellite products agree well with ground-based measurements. However, in cloudy sky with polluted atmospheric conditions, the fluxes using satellite products are overestimated by 17.5% as compared to the ground-based measurements. Aerosols below the cloud layer can bias the retrieval of the cloud optical and microphysical properties and lead to the overestimation of the shortwave radiation at ground level.

To quantitatively investigate the influence of the heavy aerosol in retrieval of the cloud properties, the RSTAR radiative transfer model is employed to simulate the retrieval error of the cloud parameters caused by aerosols in the boundary layer. The results indicate that when the aerosol optical thickness (AOT) is 0.1, the error of the surface shortwave radiation is small; whereas with the increasing AOT, the error of the shortwave radiation increases obviously. When AOT is 1.2, the relative error reaches 18.38%. For the heavily-polluted areas of North China, it is important to investigate the influence of aerosol on the retrieval of the cloud parameters and solar shortwave radiation in cloudy conditions, which is critical to the assessment of the energy budget in North China suffered from heavy aerosols below the cloud layer.