

Comparing SNPP/NOAA20 VIIRS DNB Reflected Lunar Radiances over Deep Convective Clouds

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Abstract

The Visible Infrared Imaging Radiometer Suite (VIIRS) Day/Night Band (DNB) can detect reflected lunar lights from the Deep Convective Clouds (DCC) at night as well as artificial nighttime lights with its high gain stage (HGS). This has led to many new applications both geophysical and socio-economic, such as air-glow, urban light and economic growth. With the launch of NOAA-20, there is more interest in using VIIRS DNB nighttime data for long term studies, and the consistency between SNPP and NOAA20 becomes important. In this study, we compared Suomi NPP and NOAA-20 VIIRS DNB measured reflected lunar radiance from the DCC at different phase angles. We selected VIIRS DNB lunar data in tropical region over the DCC since July 2018 to evaluate their consistency. DCC is defined as cloud with brightness temperature below 205K. DCC is known to have very stable high reflectance in the visible spectral range and therefore is used for satellite radiometer calibration. At the same time, lunar reflectance is also very stable, and the reflected lunar radiance from the DCC allows us to compare these two observations. Preliminary results show good consistency between VIIRS DNB on Suomi NPP and NOAA-20. Our findings should be of interest to many users who study long term changes in nighttime lights.