Title	Land Surface Reflectances from Geostationary Sensors

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Abstract	GEONEX is a processing pipeline that produces a suite of satellite land surface products using data streams from the latest geostationary (GEO) sensors including the GOES016/ABI and the Himawari-8/AHI. The suite, created collaboratively by scientists from NASA and NOAA, includes top-of-atmosphere (TOA) reflectances, land surface reflectances (LSRs), vegetation indices, LAI/fPAR, and other downstream products. As a key component of the GEONEX product processing, we have adapted the Multi-Angle Implementation of Atmospheric Correction (MAIAC) algorithm to produce LSRs from the TOA data. Because the algorithm depends on building "stacks" of images, we first run internal geo-registration checks to ensure geo-spatial accuracy and consistency of the input (L1B) data before transferring them from the geostationary projection into a tile system in geographic grids. Scan-time is inferred from metadata and applied to calculate the sun-sensor angles for each grid cell. The MAIAC algorithm is run to detect clouds/shadows, estimate aerosol optical thickness (AOT), perform atmospheric corrections, and generate LSRs. We have processed 18-months (from 2016/04 onward) of AHI data over East Asia and Oceania at a 10-minute time step and 10-months (from 2018/01 onward) of ABI data over North and South Americas at a 15-minute time step. As a verification measure, we compare the GEONEX (AHI/ABI) surface reflectances with the standard MODIS products (MOD09GA) and the MODIS MAIAC products over pixels that have similar sun-view geometries. The results indicate general linear relationships between GEONEX and corresponding MODIS LSRs. In particular, the RMSEs between GEONEX and MOD09 data are comparable to those between MOD09 and MODIS MAIAC products, suggesting that the uncertainties of GEONEX LSRs fall into an acceptable range. However, direct comparisons of LSRs over pixels with different sun-view angles are not as straightforward and require more modeling efforts to correct the directional effects. Evaluation of such angular influences on the downstream products (e.g., vegetation indices) is also under investigation.