Ice Products from NOAA Operational LEO and GEO Satellites



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Ice on the ocean, lakes, and rivers is an important component of the global cryosphere that has significant impact on the local and global climate and environment. Sea, lake, and river ice exists not only in the polar regions, but also well into the midlatitudes. Ice macrophysical properties, including ice cover, temperature, concentration, thickness, and motion, play an important role in climate and environment changes, and are also critical for climate monitoring and modeling, weather forecasting, shipping and navigation, fisheries, and hazard mitigation. Therefore, accurate and prompt information on floating ice is important for Earth observation, weather prediction, and the Blue Economy. With NOAA's operational Low Earth Orbit (LEO) and geostationary (GEO) satellites, the global cryosphere can be monitored frequently in time and widely in space. NOAA "Enterprise" algorithms have been developed for a suite of ice parameters including ice surface temperature, concentration, thickness, and motion. These Enterprise products are now operational for the Visible Infrared Imaging Radiometer Suite (VIIRS) on NOAA-20 and S-NPP, and AMSR2 on GCOM-W1. They will soon be operational for the GOES-16 and -17 Advanced Baseline Imager (ABI). Validation studies of these ice products have been performed against in-situ, field campaign, and other satellite measurements from buoys, IceBridge aircraft campaigns, ICESat, and CryoSat-2. Results show that their performance meets the measurement accuracy requirements. This presentation illustrates these ice products and demonstrates their suitability, validity, and applicability.

