4–8 November 2019, Kraków, Poland
ECSS2019-1

Detection of Storm-Scale Rotation from Geostationary Satellite

Dan Lindsey
NOAA/NESDIS/GOES-R Program, Fort Collins, CO, USA (Dan.Lindsey@noaa.gov)

The newest generation of geostationary satellites features an imager capable of convective storm observations never before possible. NOAA launched GOES-16 in 2016, and its Advanced Baseline Imager (ABI) has a visible band with 500 m resolution at nadir and has operational scanning frequencies as large as 1 image every 30 seconds over a mesoscale domain. In certain meteorological conditions, vertical wind shear can help advect convective anvil clouds to the northeast so that the [angled] view from geostationary satellites over the equator allows a view of the side of towering cumulus and mature cumulonimbus clouds. In the case of supercell storms, the frequent scans combined with the high spatial resolution sometimes allows for the detection of storm-scale rotation.

During two days of the checkout phase of GOES-17 in August 2018, the ABI collected images every 6.7 seconds as a test to understand what scanning frequency is necessary to adequately resolve convective scale motions at 500 m horizontal resolution. Both of these days featured rotating storms in Colorado, Kansas, and Nebraska. This presentation will highlight the observations of these storms and share the results of the scanning frequency study. EUMETSAT plans to launch Meteosat Third Generation in a few years, and its Flexible Combined Imager (FCI) has similar capabilities as the ABI. Given Europe's geographic location relatively far to the north, it's likely the FCI will be able to regularly detect rotating storms even at 2.5 minute scanning frequency. This is particularly important in areas with relatively poor Doppler radar coverage.