

Near Simultaneous on-orbit Testing of GOES-16 and GOES-17 GLM payloads from 2 NASA SLR sites using collocated GLM laser beacons

Thomas Varghese¹, Dennis Buechler², Peter Armstrong³, James Bremer⁴, Stephen Merkowitz⁵

¹NASA SLR program and Cybioms Corporation, , United States, ²University of Alabama and Marshall Space Flight Center, , United States, ³MIT Lincoln Laboratory, , United States, ⁴ASRC Federal Holding Co., , United States, ⁵Space Geodesy Project, NASA Goddard Space Flight Center, , United States

The NASA satellite Laser Ranging (SLR) stations at Monument Peak, CA, USA and Greenbelt, MD, USA were used as fiducial geodetic references for the advanced geostationary NOAA GOES 16 Geostationary Lightning Mapper (GLM) from the Post Launch Test (PLT) orbital slot at 89.5W longitude and its operational slot at 75.2W. The operational image navigation technique uses background images, however, these are only useful within the ± 2 -3 hours of the satellite noon. On the other hand, the ideally collocated NASA SLR-beacon sites can provide the most accurate geodetic data from the opposite coasts of the continental USA to support the GLM navigation, whether it is day or night. The recent launch of GOES-17 presents a unique opportunity to make near simultaneous measurements and intercomparisons. Such intercomparison of the artificial lightning flashes from the two beacons on the two GOES satellites from different orbital slots is expected to provide key insights on the GLM hardware models and the supporting ground processing algorithms (GPA) relating to the onboard sensors and cloud-tops. Details are discussed.