An ongoing GOES-R risk reduction project conducted by scientists at CICS uses TRMM data to develop the basis and eventually the algorithms to combine GOES-R ABI Infrared (IR), Geostationary Lightning Mapper (GLM) data, and microwave calibrator to provide an improved geosynchronous rainfall product. A simple IR-lightning rainfall algorithm is developed through coupling lightning measurements into the Convective/Stratiform (C/S) technique (CST) (Adler and Negri (1988), Xu et al., 2013). Preliminary results show that CST is improved by more than 30% in retrieving convective (or heavy) rainfall after lightning observations are coupled. Specifically, lightning information can aid to identify convective cores missed by the IR-only technique (improving detection), eliminate misidentified convective cores (lowering false alarm), and more correctly assign heavy convective rainfall rate.

Coincident geostationary lightning and infrared (IR) observations can help improve both the resolution and accuracy of satellite-derived precipitation products, especially when combined with more precise microwave observations from low-earth orbiting satellites. Since frequent lightning typically indicates convective cores and heavy precipitation (Grecu et al., 2000; Chronis et al., 2004; Boccippio, 2005; Wang et al., 2012, Xu et al., 2013), lightning information can simulate the microwave when microwave observations are lacking.

The ongoing and previous efforts of researchers at the Cooperative Institute for Climate and Satellites (CICS) at the University of Maryland, who have extensive experience with microwave and IR rainfall retrieval, as well as the integration of lightning into IR and microwave precipitation estimates. The planned GOES-R Geostationary Lightning Mapper (GLM) will provide an opportunity to incorporate lightning with IR (Xu et al., 2012, 2013) and microwave (Wang et al., 2012) rain estimates from JPSS and GPM mission to improve the operational precipitation products.