



Potential of convective rainfall estimation from lightning data in the context of the “Simulation of Meteosat Third Generation - Lightning Imager through Tropical Rainfall Measuring Mission – Lightning Imaging Sensor data”.

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The Centro Nazionale di Meteorologia e Climatologia Aeronautica recently hosted a fellowship sponsored by Selex Galileo, with the intent to study and perform a simulation of Meteosat Third Generation - Lightning Imager (MTG-LI) sensor behavior through Tropical Rainfall Measuring Mission - Lightning Imaging Sensor data (TRMM-LIS).

For the next generation of earth observation geostationary satellite, major operating agencies are planning to insert an optical imaging mission, that continuously observes lightning pulses in the atmosphere; EUMETSAT has decided in recent years that one of the candidate mission to be flown on MTG is LI, a Lightning Imager.

MTG-LI mission has no Meteosat Second Generation heritage, but users need to evaluate the possible real time data output of the instrument to agree in inserting it on MTG payload. Authors took the expected LI design from MTG Mission Requirement Document, and reprocess real lightning dataset, acquired from space by TRMM-LIS instrument, to produce a simulated MTG-LI lightning dataset. The simulation is performed in several run, varying Minimum Detectable Energy, taking into account processing steps from event detection to final lightning information.

A definition of the specific meteorological requirements is given from the potential use in meteorology of lightning final information for convection estimation and numerical cloud modeling.

Study results show the range of instrument requirements relaxation which lead to minimal reduction in the final lightning information.

Potential in convective rainfall estimation over ocean from space lightning observation is addressed and a retrieval example making use of lightning ground network data is reported both with validation by radar observation.