

Topics (T)

Earth Observing Missions and Systems to Address Climate Change and Its Impacts [1] (3A)

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METEOSAT THIRD GENERATION (MTG) SATELLITES SERIES - THE LAUNCH AND IN-ORBIT
CHARACTERISATION OF THE FIRST IMAGERY SATELLITE SERIES OF MTG

Abstract

The Meteosat Third Generation (MTG) Programme is being realised through the well-established and successful Cooperation between ESA and EUMETSAT. It will ensure the future continuity with, and enhancement of, operational meteorological (and climate) data from Geostationary Orbit as currently provided by the Meteosat Second Generation (MSG) system, the last of which MSG4/MET11 has been successfully launched and commissioned in 2015.

The MTG satellites series composed of 4 MTG-I and 2 MTG-S will bring to the meteorological community a continuous imagery and sounding capabilities with high spatial, spectral and temporal resolution observations and geophysical parameters of the Earth based on sensors from the geo-stationary orbit. In particular, the imagery mission MTG-I will bring an improved continuation of the MSG satellites series with the Flexible Combined Imager (FCI) a broad spectral range (from UV to LWIR), covering extensive areas (global and regional), and with an improved time scale to continue and enhance the MSG services. Furthermore, MTG-I carries additional payloads composed of the Lightning Imager (LI) for lightning detection for early convection detection, the Data Collection Dissemination and Search Rescue Missions. The MTG-S will bring unprecedented features to the end users with a high spectral resolution (0.625 cm⁻¹) and a high spatial resolution (4 km SSD) of the IRS instrument. The IRS mission will provide the capability to determine the altitude from which emissions emanate, providing a capability for vertical profiling of the atmosphere (water vapour tracking profiling, and temperature profiling), thus allowing vertical wind vectors to support nowcasting and very-short range forecasting (VSRF), 3D fields of wind, temperature and humidity, and hence moisture convergence and convective instability, to help improve warnings of location and intensity of convective storms. Moreover, thanks to the GMES Sentinel-4 (S4) sounding mission embarked on MTG-S, the mission will achieve through this UVN Instrument with three spectral bands (UV: 305 - 400 nm; VIS: 400 - 500 nm, NIR: 750 - 775 nm). The combination of the IRS and the UVN missions can support air quality and chemistry missions for the atmospheric science from geostationary orbit.

MTG-I1 satellite is scheduled to be launched mid-December 2022, whilst the main elements of the MTG-S1 satellite are now integrated and undergoing module level testing prior to a launch foreseen in Q3/2024.

This paper will provide an overview of the MTG satellites series features and the in-flight performance characterisation results of MTG-I1 versus the associated mission requirements.