Global sensitivity analysis to assess instrument capability for the study of the future Meteosat Third Generation/Flexible Combined Imager (MTG/FCI) to detect aerosols.

**Future: Meteosat MTG**

Meteosat Third Generation is the next European generation of geostationary meteorological satellites:

- 1/3 of entire earth surface observed by 1 satellite
- Full scan every 10 min with a spatial resolution between 0.5 and 2 km at nadir, depending on channel
- 16 channels of observation included in the imager (FCI)

**Objective:** How to assess the capability of MTG/FCI to detect dust aerosols?

**Simulator**

200,000 sets of atmospheric conditions:

- AERONET, Tamanrasset_INM (level 2.0 and 1.5) → Aerosol Optical Depth (AOD), Water Vapor (WV)
- MODIS MCD43B3 2000-2004 → ground albedo
- MACC Ozone Product, closest grid point of Tamanrasset → Total Column Ozone

MTG/FCI properties for each channel:

- Spectral response function
- Calibration
- Signal to Noise Ratio

**Results**

Block diagram of the SIMULATOR output

- Global sensitivity analysis

**Conclusion**

Relative influence of variables may be deduced from the GSA and removed, thus reducing the uncertainty of the reflectance residual with AOD. Leading to the estimation of the capabilities of MTG/FCI to detect aerosols which are deduced from narrower dispersion.