

**Impact of Solar Activity on Thermospheric Density during ESA's Gravity Mission GOCE**

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The impact of solar activity on thermospheric density during ESA's gravity mission GOCE (17 March, 2009 - 11 November, 2013, rising phase of solar cycle 24) has been investigated using different solar indices. Thermospheric densities at a mean altitude of 254 km, derived from the high-precision accelerometers on board the GOCE satellite, represent a unique low-altitude dataset. Solar activity indices such as the F10.7 flux, the Mg II core-to-wing ratio and the Ap geomagnetic index in the period of GOCE mission have been firstly examined in time and their correlations with GOCE thermospheric density have been studied. Then, solar indices have been analyzed through the Empirical Mode Decomposition (EMD), a technique best suited in analyzing non-stationary and non-periodic time signals. After extracting the individual components (IMFs) from the solar indices, thermospheric density have been reconstructed and compared with the GOCE dataset. The preliminary results presented in this work suggest how significant advantages may be gained using the Mg II index and EMD method in describing the solar-thermospheric connection.