



Solar flare effects on the thermosphere and E-layer as observed by GRACE and DEMETER

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We investigate the effect of solar flares on the lower thermosphere and ionosphere of the Earth. For this study we select solar flares which occurred in the period from Nov. 2004 to Sept. 2005. We combine the measurements of the GRACE and DEMETER satellites which lead us to estimate, respectively, the atmospheric density and the electric field variation at an altitude of about 100 km. The accelerometer measurements from GRACE orbiting at an altitude of about 450 km comprise all non gravitational forces acting on the satellite and may be used to determine the atmospheric neutral density. The intensity variation of the transmitter ground signals is detected by DEMETER at an altitude in the order of 700 km. In this study we insist on an atmosphere-ionosphere coupling effect which may appear at an altitude of about 100 km. This crucial altitude corresponds to critical regions where important changes are observed in the atmosphere (Mesosphere/Thermosphere) and in the ionosphere (D/E layers). We discuss the possible correlation between the measurements of GRACE and DEMETER observations, where both the local and global effects are taken into consideration.