

Modeling of thermospheric variation affecting low-earth-orbiting satellites

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These days, many satellites are flying in the region of thermosphere and some of them are used for communications and broadcasting. The satellites are essential for our daily lives and it is thought that the thermosphere will become more familiar with us in near future. It is well-known that the changes in thermospheric density are caused by the changes of solar extreme ultraviolet radiation, geomagnetic activity and effects from the lower atmosphere. The changes in thermospheric density affect trajectories of low earth orbiting satellites. In this study, various changes in thermospheric density are calculated using a one-dimensional thermosphere model. The drag force is also estimated and the capability of perturbing a satellite orbit by the drag force will be discussed in several cases.