Geophysical Research Abstracts,
Vol. 11, EGU2009-7738, 2009
EGU General Assembly 2009


# Static and Time-Varying Atmospheric Density Models for Drag Effect Modeling

M. A. Sharifi and M. Mahooti
Tehran, Faculty of Engineering, Geomatics, Islamic Republic Of Iran

Abstract
Drag, unlike other perturbation forces, is a non-conservative force and will continuously take energy away from the orbit. Thus, the orbit semi major axis and the period are gradually decreasing because of the effect of drag. An accurate prediction of the satelliteś motion under the influence of drag requires a good density model of the upper atmosphere. Over the past few decades, various density models have been developed. Atmospheric density models are classified as static and time-varying models. Harris-Priester is the most popular static model which determines the physical properties of the upper atmosphere theoretically by solving the heat conduction equation under quasi-hydrostatic conditions. Approximations for fluxes from the extreme ultraviolet and corpuscular heat sources are included, but the model averages the semiannual and seasonal latitudinal variations and doné attempt to account for the extreme ultraviolet 27-day effect. One of the recent time-varying atmospheric models is the NRLMSISE-00 which gives the major and many minor species of atmosphere as a function of altitude, date, time, location, solar flux and magnetic index. In this article, drag effect is evaluated for the prediction of the Envisatś state vector using the Harris-Priester and the NRLMSISE-00 models.

Keywords: Drag Effect, Atmospheric Density Model, Harris-Priester, NRLMSISE-00