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General circulation modelling for improving satellite drag models

Timothy Spain (1), Alan Aylward (1), Anasuya Aruliah (1), and Herbert Carlson (2)

(1) Department of Physics and Astronomy, UCL, London, United Kingdom, (2) Space Weather Centre, Utah State University, Logan, UT, USA

The DTM model uses a spherical harmonic decomposition of the thermospheric neutral density. To fit the coefficients of these harmonics, data over a wide area would be preferable to the single tracks of data provided by in-situ satellite drag measurements. A general circulation model provides data worldwide, but without data assimilation, there is no guarantee that the absolute values of the density it provide match with those observed by the satellites. The CMAT2 model was used to investigate the global and time variation of upper thermospheric density, including case studies of specific events, and their impact on the thermospheric density at satellite altitudes. The model was also run for a full calendar year to track the density variation during 2009.