New measurements of thermospheric neutral density: A Review

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Abstract: Uncertainties in neutral density variations continue to be the major source of satellite drag errors. Accurate thermospheric density measurements have historically been one of the limiting factors in achieving high accuracy satellite drag forecast models. This situation has been greatly ameliorated by expansive new data sets that have become available in this century. Data include those from ground-based radar tracking of satellite orbital decay and from satellite-borne accelerometers and remote sensors. These measurements, with complementary spatial and temporal capabilities, now permit global thermospheric monitoring over a wide range of altitudes and solar/geomagnetic conditions. The new data permit development of improved thermospheric models, provide constraints on physical model thermospheric driver estimation processes and support advanced operational assimilation forecast models. This paper highlights aspects of selected recent measurements and their application to outstanding satellite drag problems.

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