Thermospheric density and wind determination from satellite dynamics

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Abstrak

The opening chapters of this thesis provide an excellent introduction to the various disciplines that are involved in the interpretation of these observations, orbital mechanics, satellite aerodynamics and upper atmospheric physics. A subsequent chapter, at the heart of this work, covers advances in the algorithms used for processing satellite accelerometry and Two-Line Element (TLE) orbit data. The closing chapters provide an elaborate analysis of the resulting density and wind products, which are generating many opportunities for further research, to improve the modelling and understanding of the thermosphere system and interactions with the lower atmosphere, the ionosphere-magnetosphere system and the sun.