

## EP 5: Near Earth Space

Zeit: Donnerstag 11:00–12:00

Raum: HS 19

**Hauptvortrag** EP 5.1 Do 11:00 HS 19  
**Machine Learning and Atmospheric-Ionospheric Coupling** —  
 •JERRY CZARNECKI — Leibniz-Institut für Atmosphärenphysik

It is known that the atmospheric tides have significant effects on the spatial and temporal structure of the Earth's ionosphere and vice versa. This feedback mechanism, which is itself a manifestation of the actions and interactions of the E- and F-region dynamos, is not fully understood but is an important factor that influences the Mesospheric-Lower Thermospheric (MLT) tidal winds at mid and high latitudes. Understanding and quantifying these influences is important for improving current physical models of the E- and F-region dynamos and the associated feedback mechanisms on the tides. The focus of this talk will be the potential application of Machine Learning techniques to the study and quantification of the MLT wind-ionospheric interaction and the challenge of data preparation. A discussion of some challenges encountered during an ongoing investigation into this atmospheric-ionospheric interaction will be discussed.

**Hauptvortrag** EP 5.2 Do 11:30 HS 19  
**New Results in Modelling the Space Debris Environment** — •CARSTEN WIEDEMANN<sup>1</sup>, ANDRE HORSTMANN<sup>1</sup>, SEBASTIAN HESSELBACH<sup>1</sup>, VITALI BRAUN<sup>2</sup>, HOLGER KRAG<sup>2</sup>, SVEN FLEGEL<sup>3</sup>, and

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At the Institute for Space Systems of the TU Braunschweig, the latest version of the European model for the description of the space debris environment MASTER is currently being developed. MASTER stands for "Meteoroid and Space Debris Terrestrial Environment Reference". The development is carried out on behalf of the European Space Agency ESA. The model considers numerous different sources of space debris. As part of the update, the contributions of the individual sources have been scientifically revised. This revision includes to a lesser extent the introduction of new sources. Far more important, however, is the addition of further events to already considered sources that were not known in the past. It is also necessary to add events that have occurred since 2009, when the last version of the MASTER model was published. The revision includes the complete creation of the historical particle population on Earth orbits. The particle flux, to which satellites are exposed today, will be shown here for various selected mission examples.