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Poster
NRLMSIS® is an empirical atmospheric model that extends from the ground to the exobase and describes the average behavior of temperature, composition, and mass density, as a function of day of year, time, location, solar and geomagnetic activity. Over the last ten years the MSIS model has undergone major upgrades, including the assimilation of extensive new data sets, reformulation to couple species densities to the entire temperature column, and the addition of nitric oxide. As part of the development team’s continuing efforts to enhance the MSIS model for scientific and space weather applications, we are currently working on incorporating non-migrating tidal variations in temperature in the middle and upper atmosphere, as well as formulating an empirical model of carbon dioxide (the tenth species to be represented in the model); both of these efforts require upgrades to the model software. Prospective future developments of the MSIS model include major revision of the thermosphere using more recent neutral temperature and density observations, incorporation of long-term trends, reformulation of geomagnetic and solar terms, and the addition of ozone and water vapor. This presentation will provide an overview of the MSIS model, its history, highlight recent model releases and scientific results, describe progress on incorporating non-migrating tidal variations and carbon dioxide, and motivate upcoming model developments.

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