

**Rachel A. Miller**

HAO

Mentors: Barbara Emery, Xiaoli Luan

Title: Aurora Parameterization in the TIE-GCM Model

**Abstract:**

The aurora is formed when high-energy particles from the solar wind are guided by earth's magnetosphere into the upper atmosphere, where they interact with nitrogen, oxygen, and other particles. This auroral precipitation is modeled in NCAR's Thermosphere Ionosphere Electrodynamic General Circulation Model (TIE-GCM). However, substantial discrepancies between the auroral model and satellite observations still exist. To reduce these discrepancies, energy flux and electron mean energy measurements from the Global Ultraviolet Imager (GUVI) on the Thermosphere Ionosphere Mesosphere Energetics and Dynamics (TIMED) satellite were averaged from 2002 to 2007 as a function of Kp index and compared with the TIE-GCM aurora model. The TIE-GCM auroral parameters for energy flux and electron mean energy were then modified as a function of hemispheric power to more closely fit GUVI observations. Seasonal variations in energy flux and electron mean energy found in GUVI data were also found for low Kp.