# 3D GCM modelling of thermospheric nitric oxide during the 2003 Halloween Storm using high resolution solar flux data.

**A. Dobbin** and A. Aylward

Atmospheric Physics Laboratory, Department of Physics and Astronomy, University College London, London, UK

(a.dobbin@ucl.ac.uk)

Radiative emission by excited nitric oxide (NO) is an important cooling mechanism in the lower thermosphere. Numerical modelling of thermospheric temperatures must therefore include a realistic representation of NO densities. At low latitudes, the abundance of this key constituent is thought to be is directly related to the flux of solar soft X-ray radiation while at high latitudes, NO is affected by the flux of precipitating electrons. In the present study, the coupled middle atmosphere and thermosphere (CMAT) general circulation model has been used to simulate the 11-day period from 23rd October to 3rd November 2003. During this time the Earth was subject to highly variable solar irradiance and extremely high levels of geomagnetic activity. The 3D model used incorporates a complex ion and neutral chemical scheme, including a detailed self consistent calculation of NO production and transport. High-resolution solar flux data taken from the SOLAR2000 irradiance model is incorporated, along with variable auroral energy inputs. Predictions of the global distribution of nitric oxide in the lower thermosphere are presented along with thermospheric temperatures for the storm period.