

Empirical thermosphere model

The following variations are modeled (temperature and composition)

periodic

diurnal

semi-diurnal

ter-diurnal

annual

semi-annual

(+ coupling with solar activity)

non-periodic

latitude (zonal)

longitude

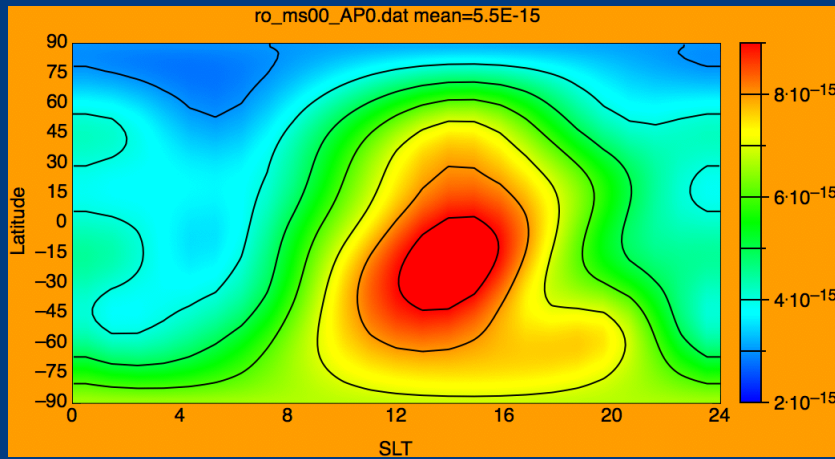
solar activity

geomagnetic activity*

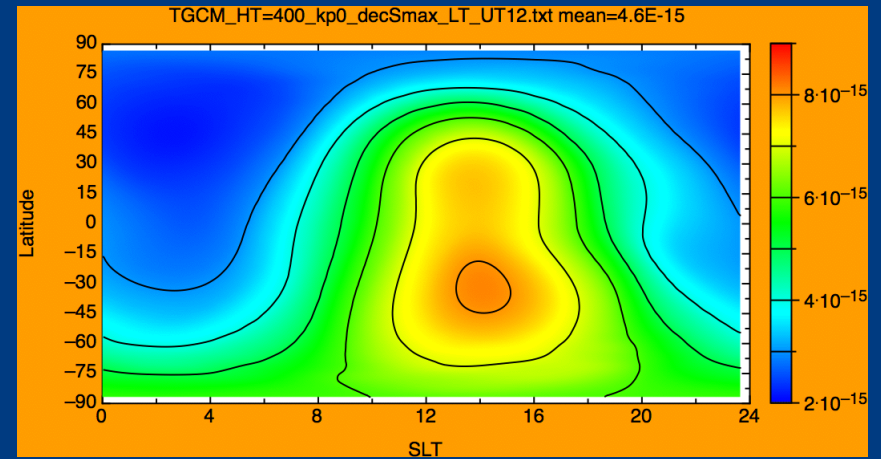
* ap (3-hourly and 24 hr means combination)

Model comparison - example

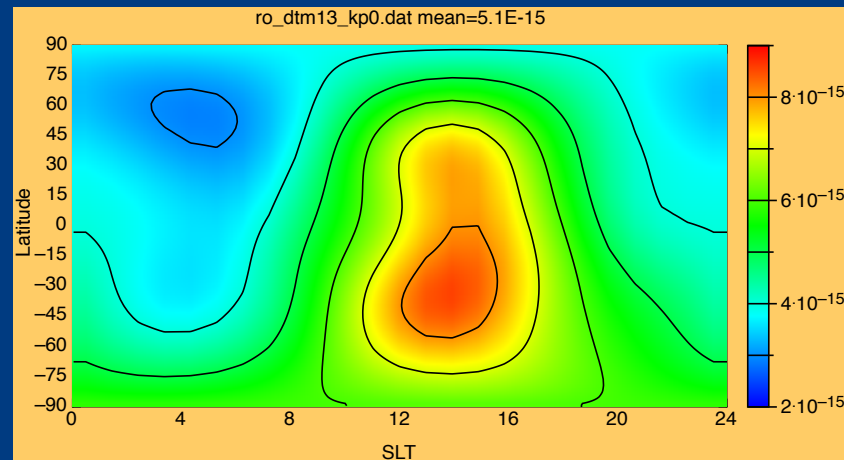
NRLMSIS00



TGCM



DTM2013

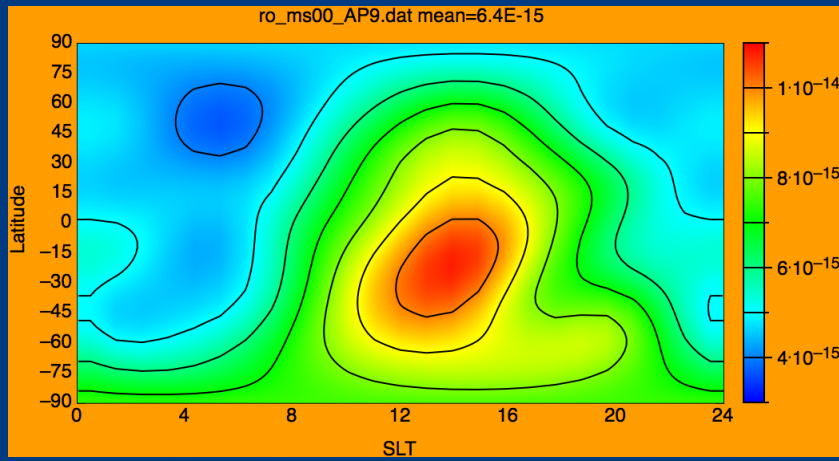


kp=0

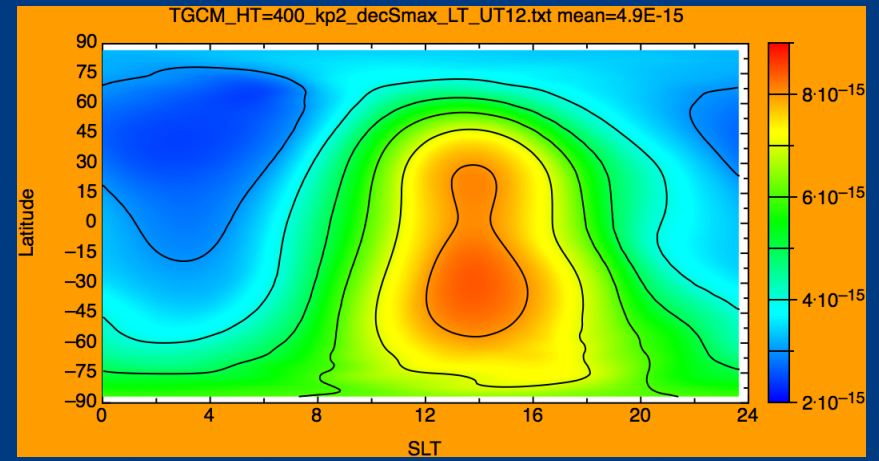
Example: density at 400 km, F10.7=190, 21 December

Model comparison - example

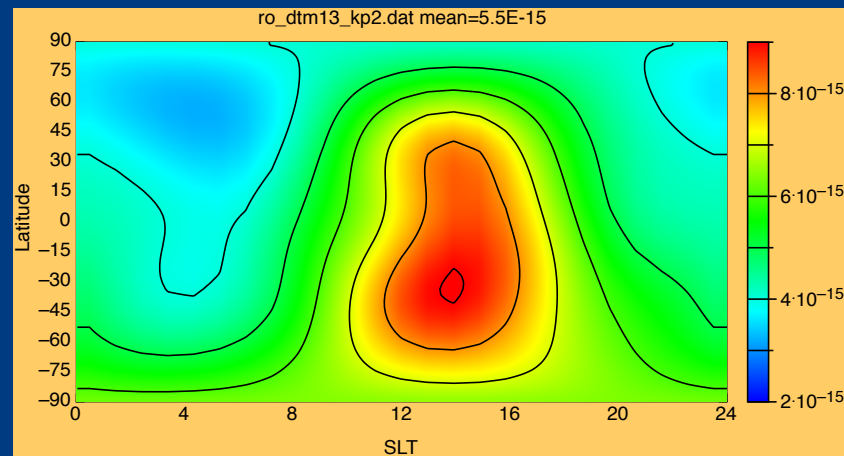
NRLMSIS00



TGCM



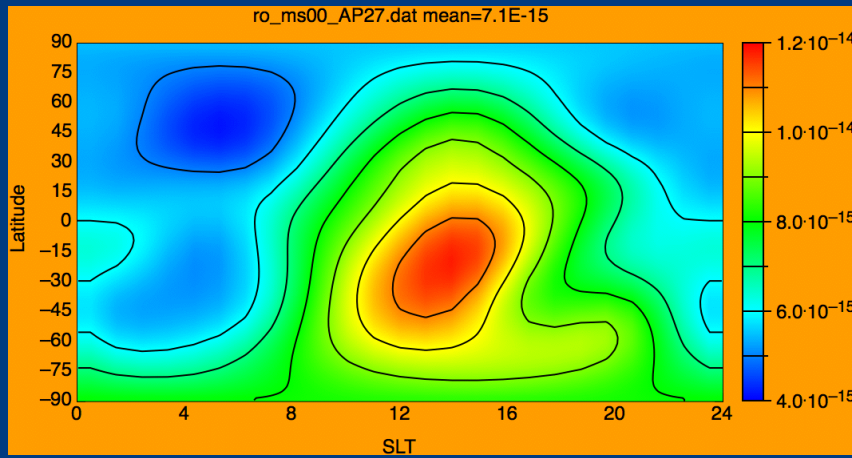
DTM2013



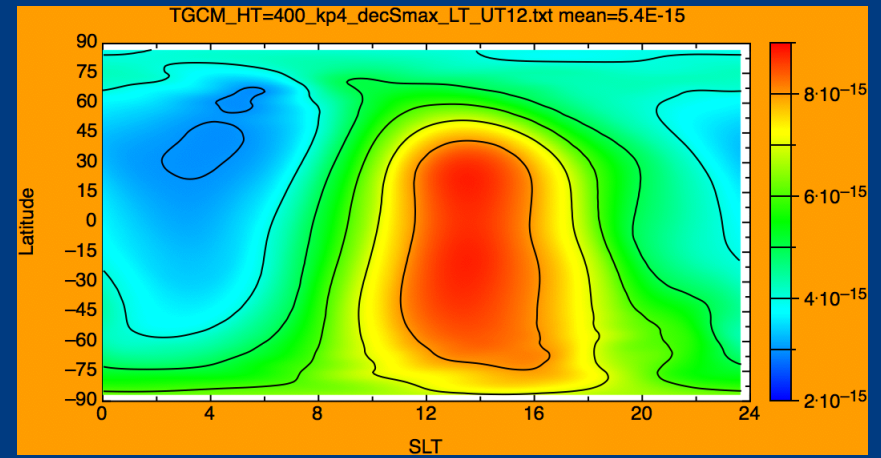
Kp=2

Model comparison - example

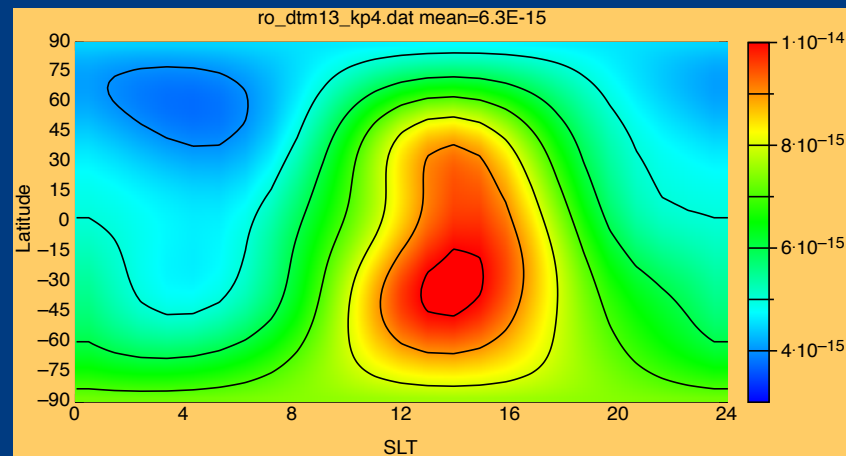
NRLMSIS00



TGCM



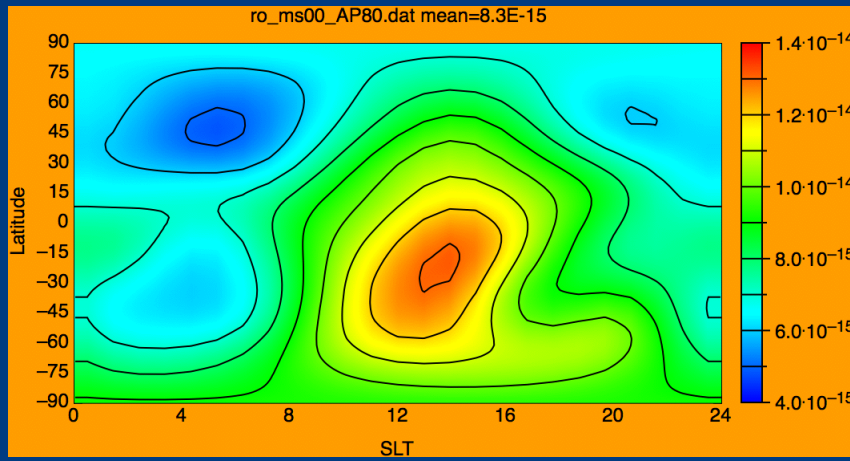
DTM2013



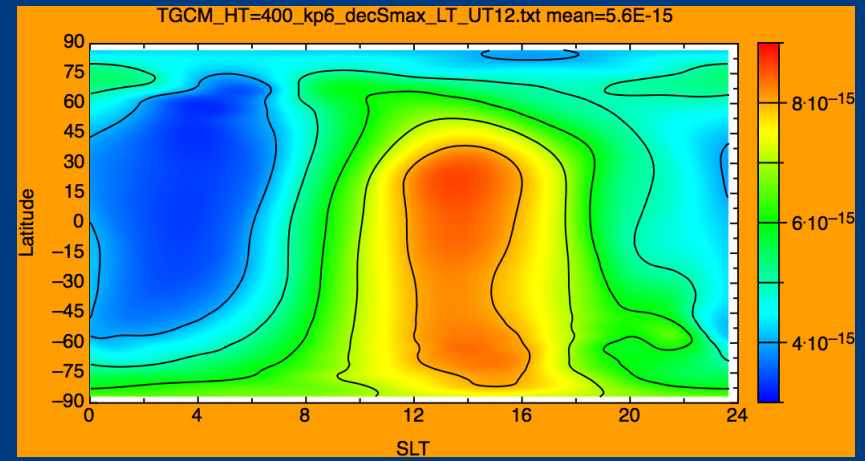
Kp=4

Model comparison - example

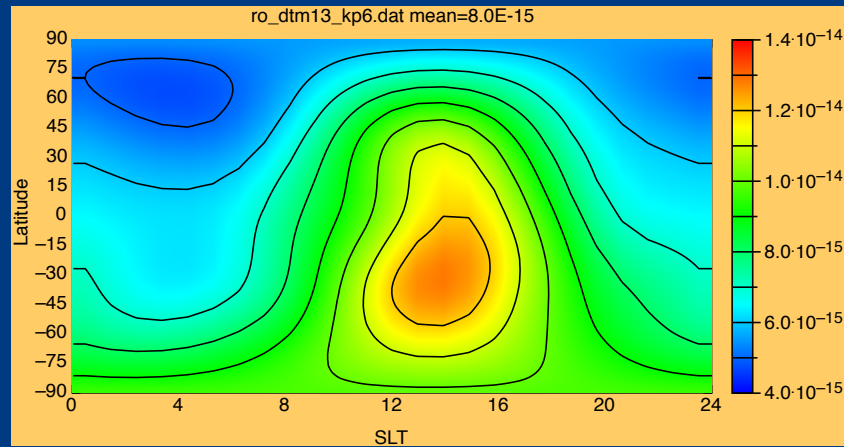
NRLMSIS00



TGCM



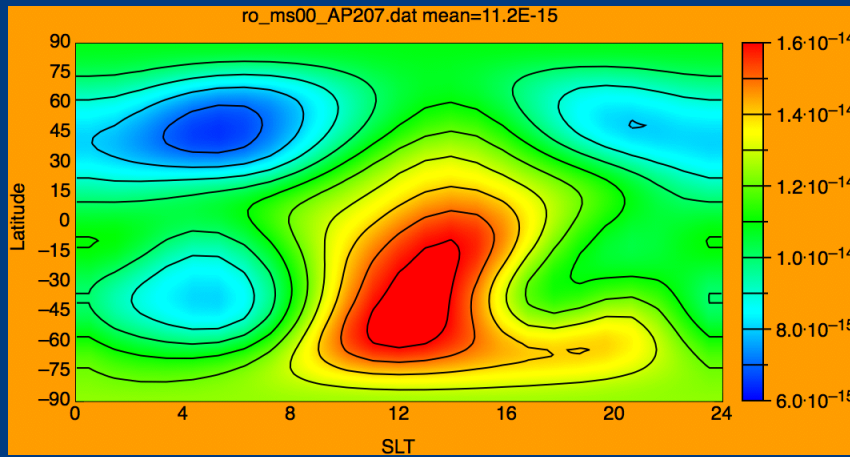
DTM2013



Kp=6

Model comparison - example

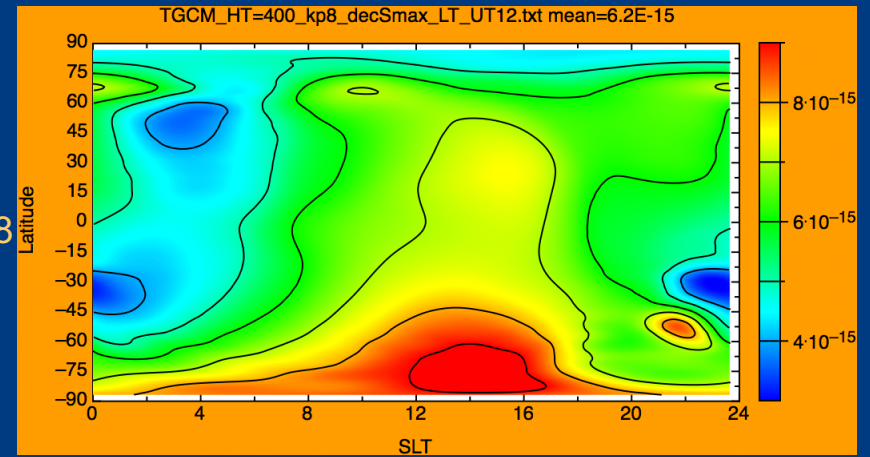
NRLMSIS00



2.03

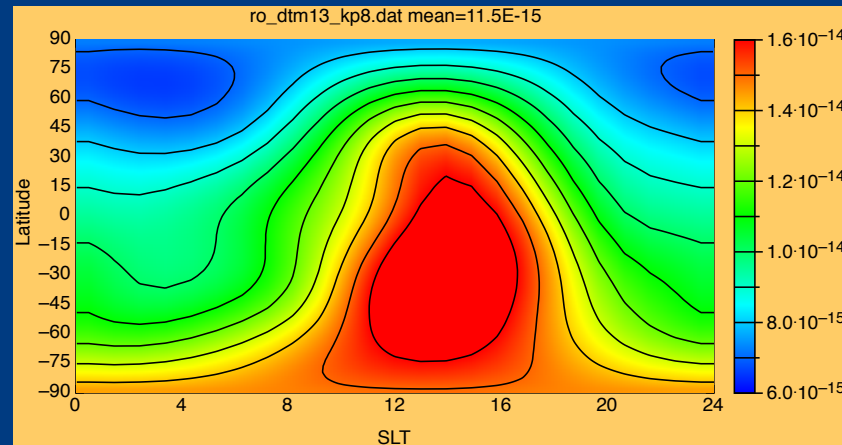
= Ratio k_p8/k_p0 =

TGCM



1.35

DTM2013

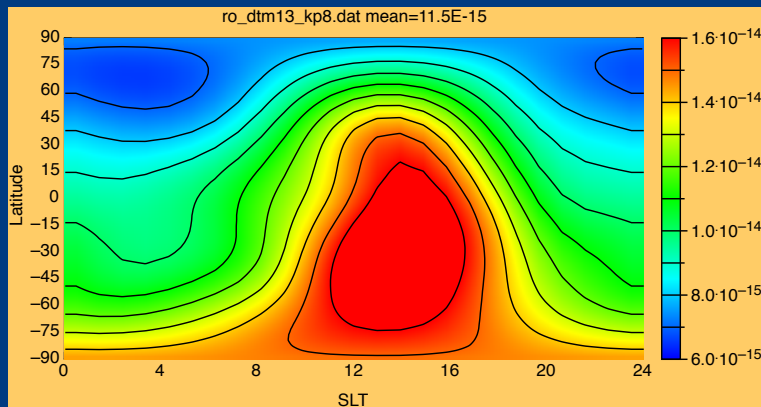
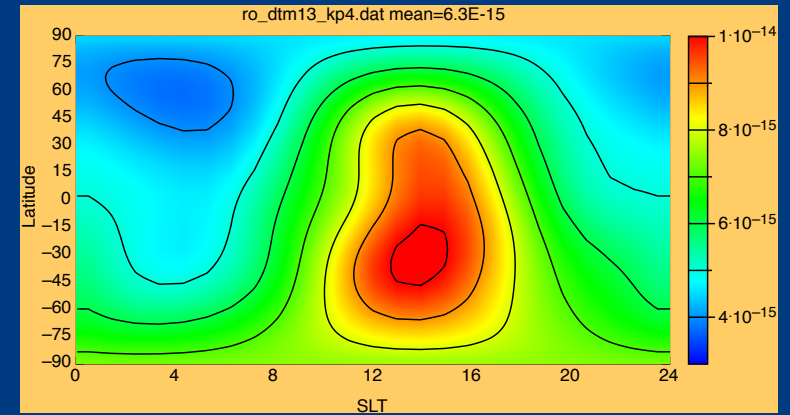
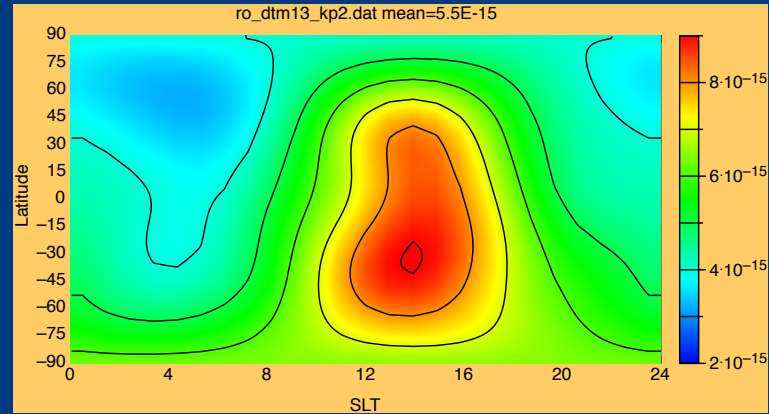
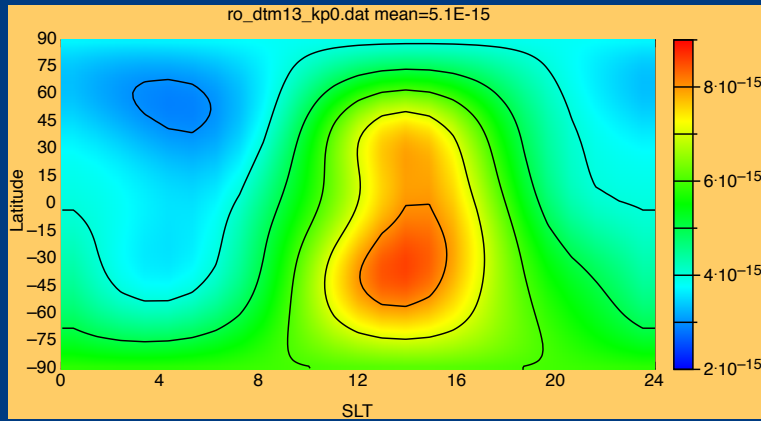


Ratio k_p8/k_p0 = 2.25

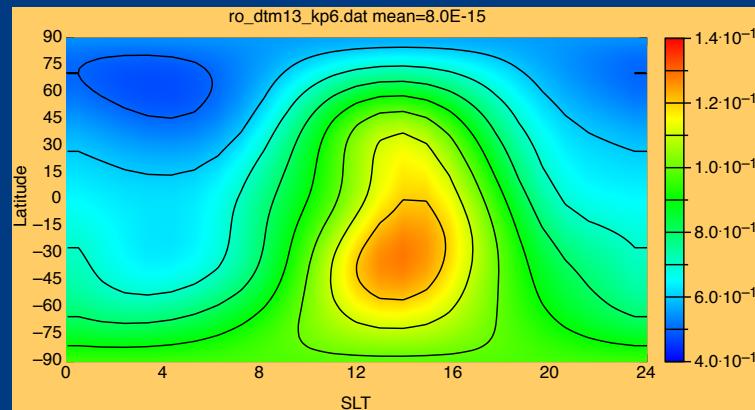
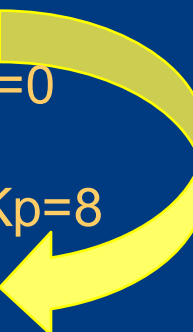
Kp=8

- Differences:
- Amplitude
 - Structures
 - Resolution

Model comparison - example

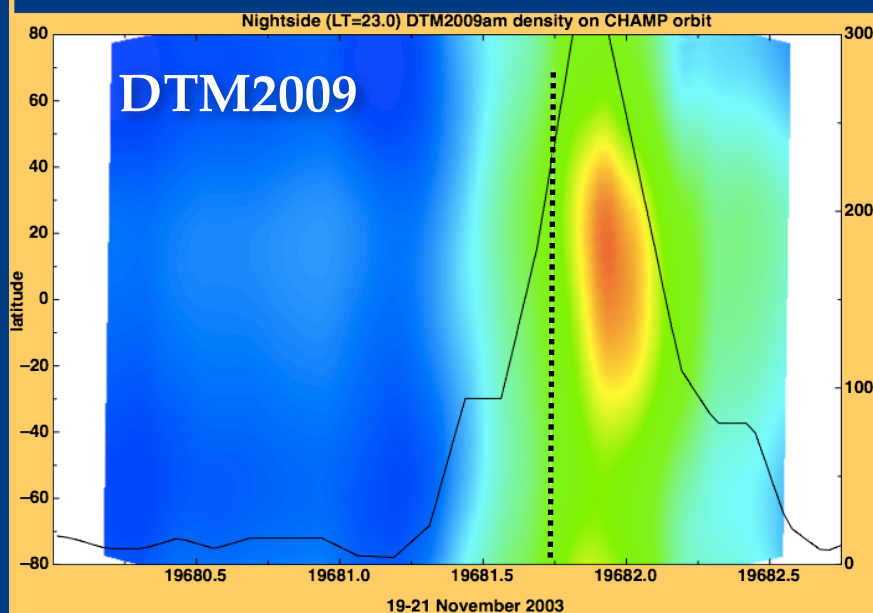
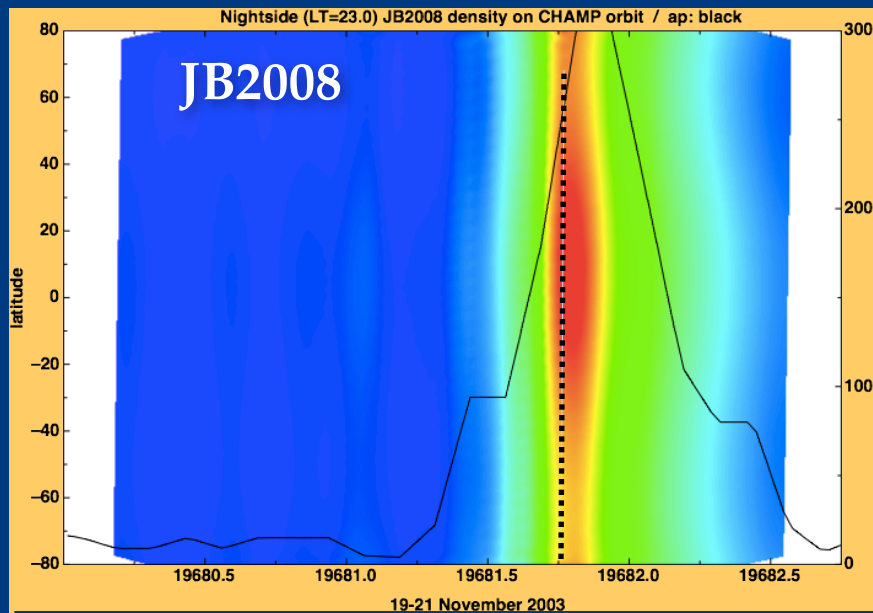


Kp=8



Basic shape almost constant

Model comparison - observations



20 November 2003, nightside

