

Different Drivers for the TIEGCM for December 2006

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<http://ccmc.gsfc.nasa.gov/challenges/GEM-CEDAR/>

Different High-Latitude Driver Studies

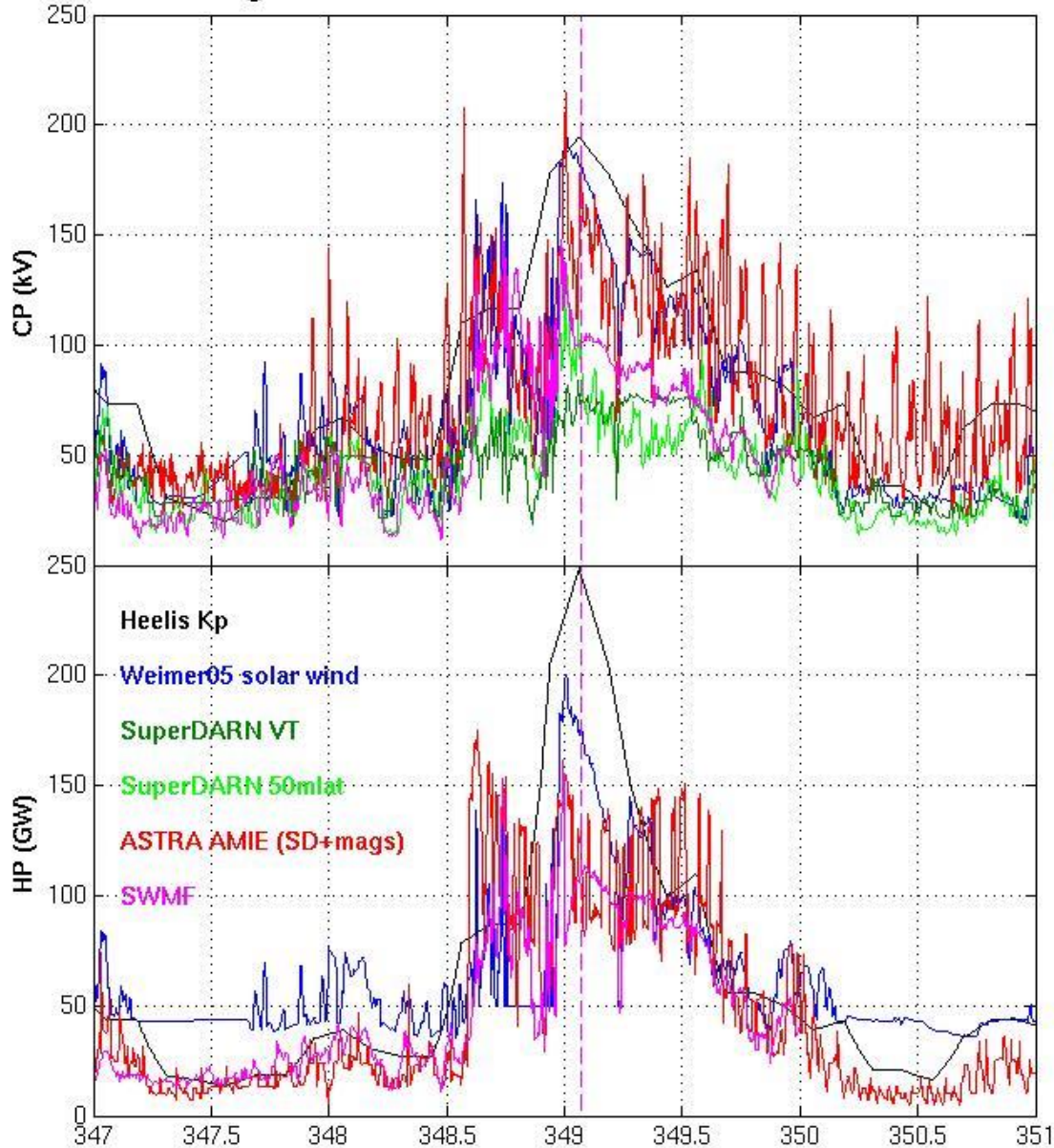
- First discussed at mini-GEM December 2011
- First results at CEDAR 2012 with further results at each successive meeting.
 - GITM (**U MI suite of routines** for U MI binary files) and
 - CCMC (**CCMC suite of kameleon routines and libraries** for .hdf files discussed by David Berrios)
 - Kameleon memory leak fixed in March 2014
- TIE-GCM has **HAO/NCAR suite of routines** for “AMIE-type” files (**HAO** binary, **U MI** binary, **ASTRA** ascii, **SuperDARN** ascii), **kameleon** .hdf files, and **CMIT inputs** (large code changes). All but CMIT inputs available in s/w release soon.

8 HAO/NCAR December 2006 Drivers

- 1) CMIT/MIX-TIEGCM (not shown, is separate 2-way code, but could be 1-way input if read as “AMIE-type” or kameleon files)
- 2) Heelis Kp-driven convection and Kp aurora
- 3) Weimer 2005 solar wind convection and aurora
- 4) CCMC kameleon drivers: ASTRA AMIE, SWMF
- 5) AMIE-type: U MI AMIE (not shown), ASTRA AMIE, SuperDARN (Dartmouth to 50mlat and VT to 60mlat with Kp aurora)

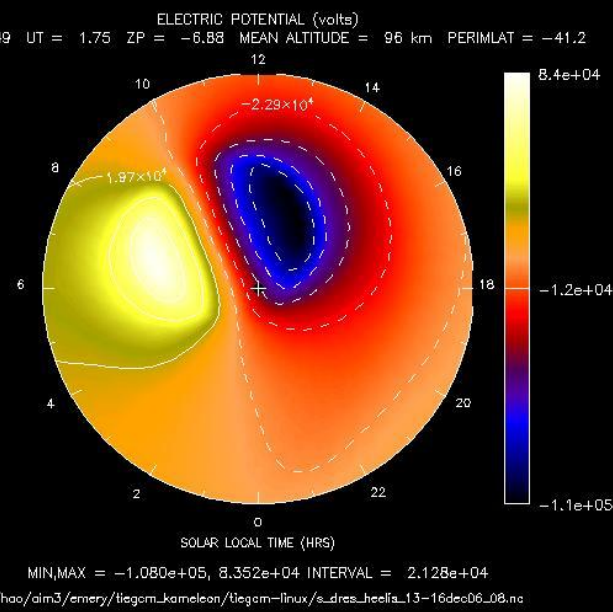
Show results on 2.5 deg grid for 6 drivers with 1 min time step (~40 min/day, except for SDD 30 sec 349-350). Other 2 only on 5 deg grid.

High-Latitude Drivers for December 13-16, 2006

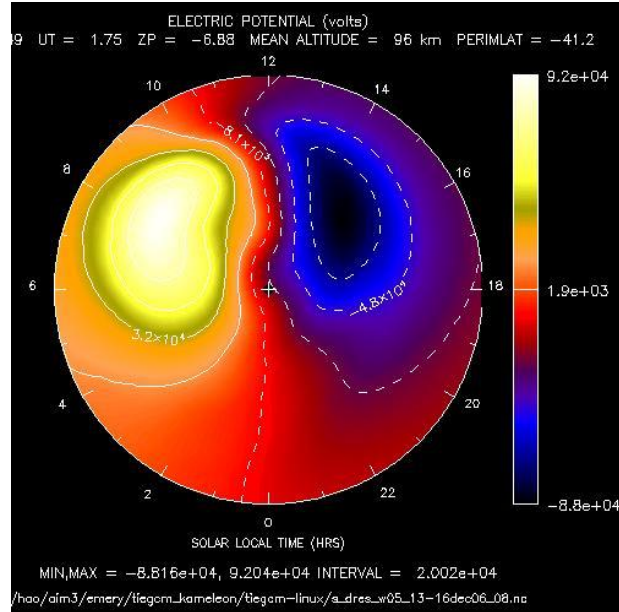


The most common runs are Heelis Kp, Weimer05 solar wind, and SuperDARN VT.

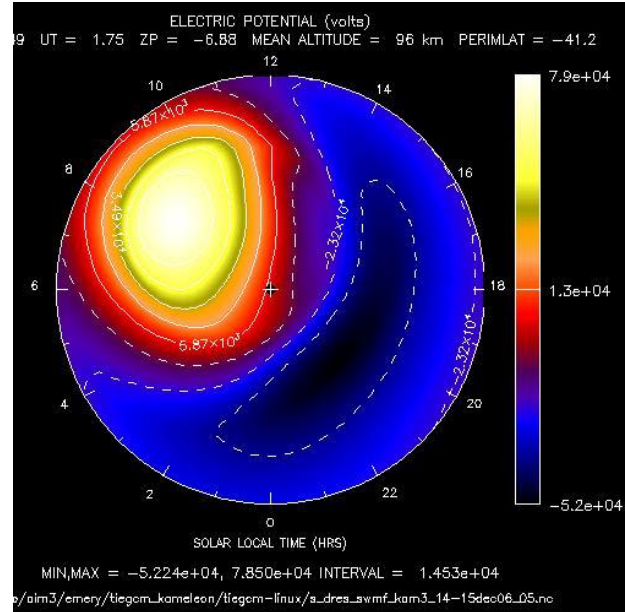
Daily data at <http://vt.superdarn.org/tiki-index.php?page=ASCIIData>



Heelis Kp 193kV



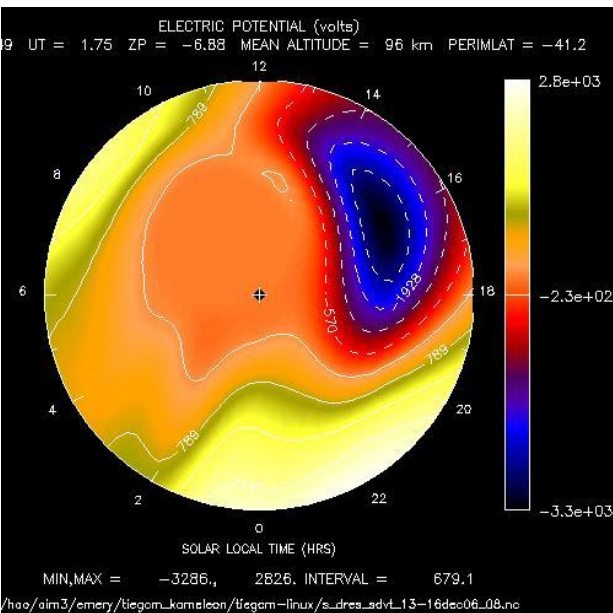
Weimer05 181kV



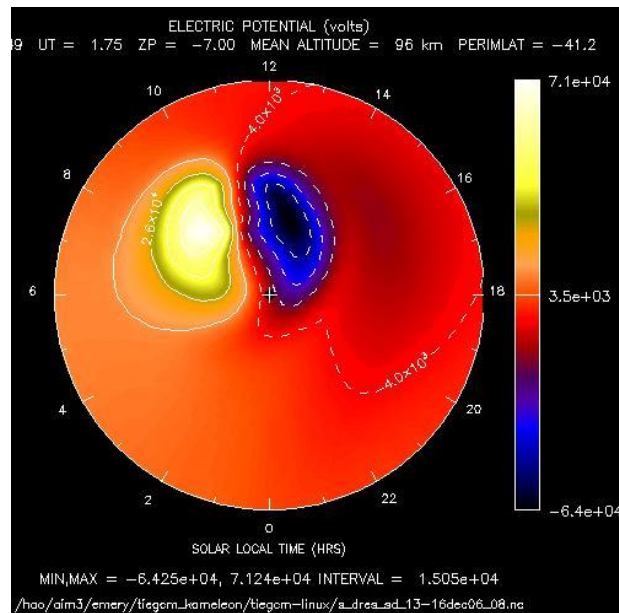
SWMF 100kV

SH 06349 0145UT

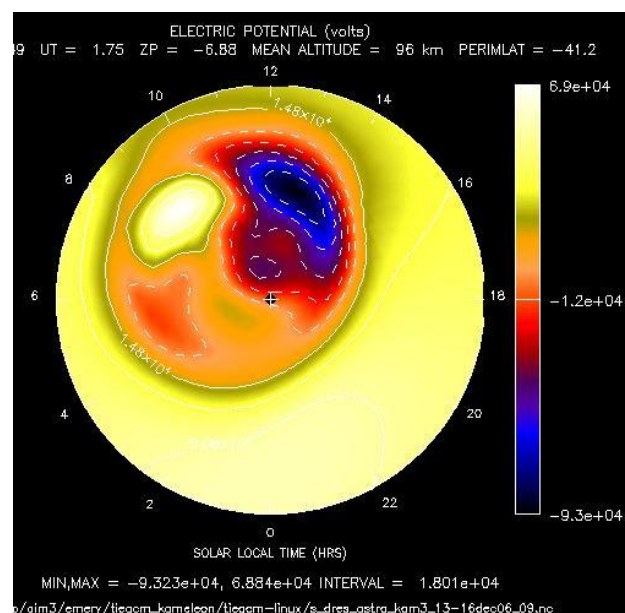
SuperDARN VT 75kV

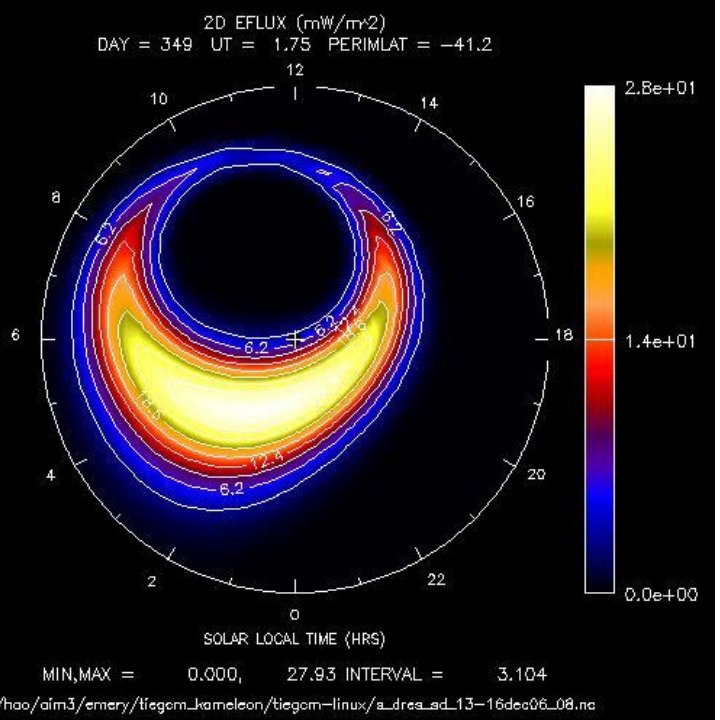


SuperDARN 50mlat 139kV



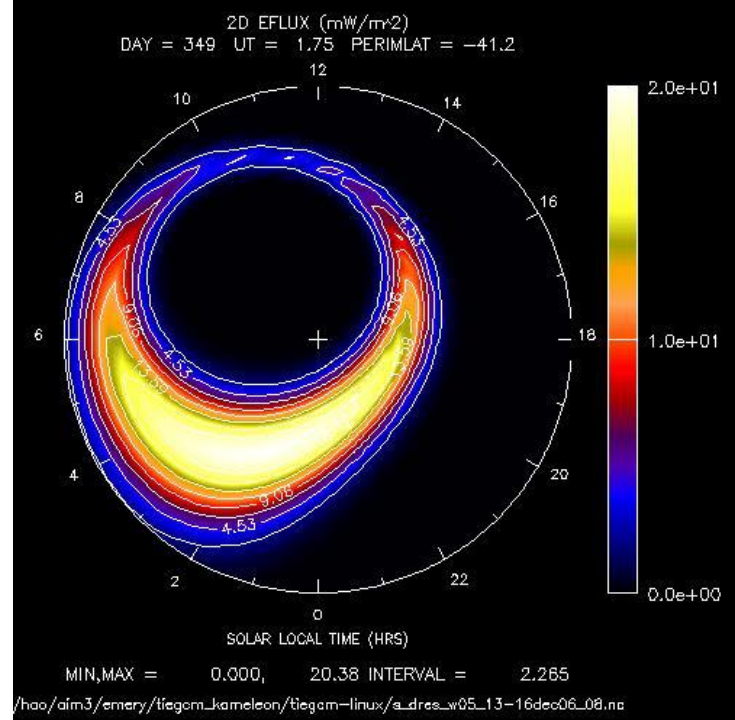
ASTRA AMIE SD+mags 186kV



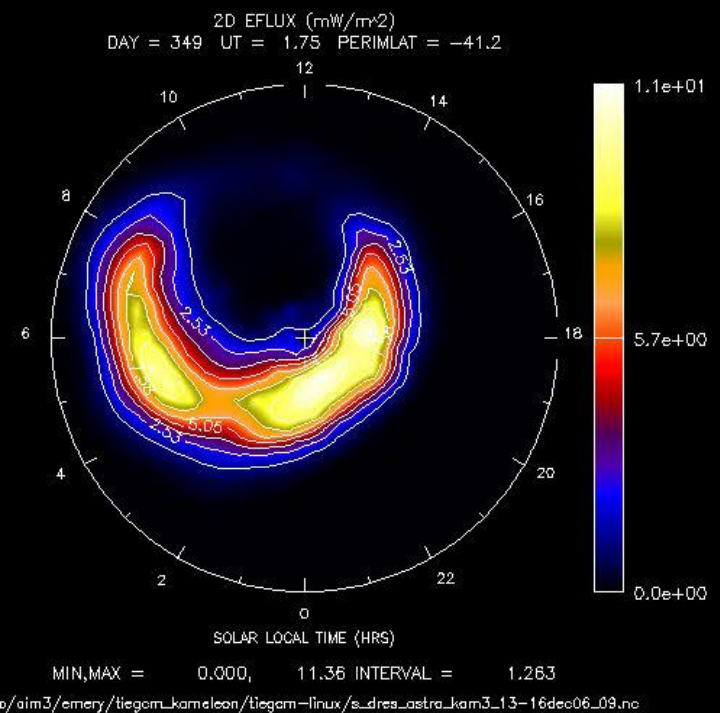


Eflux

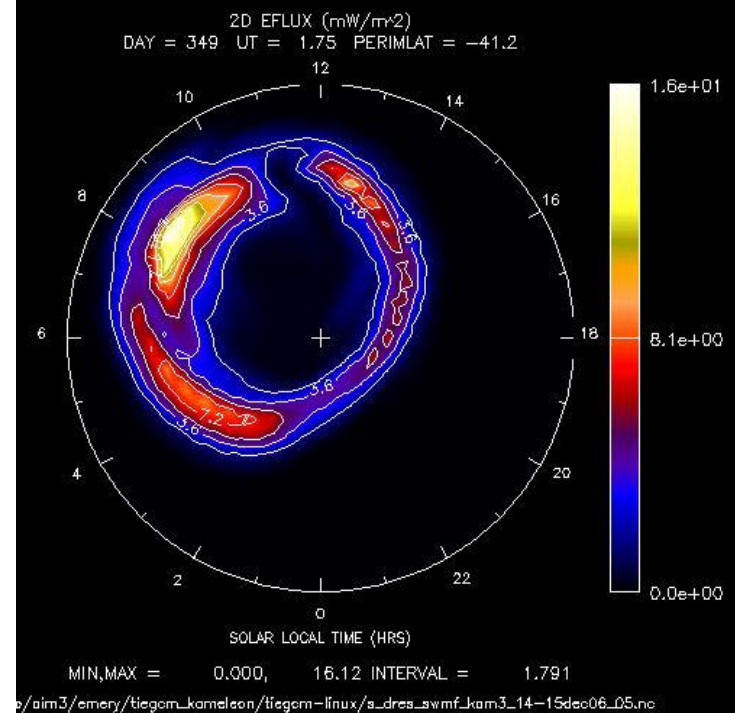
Kp TIEGCM
442GW SH of
245GW given
(354GW NH)



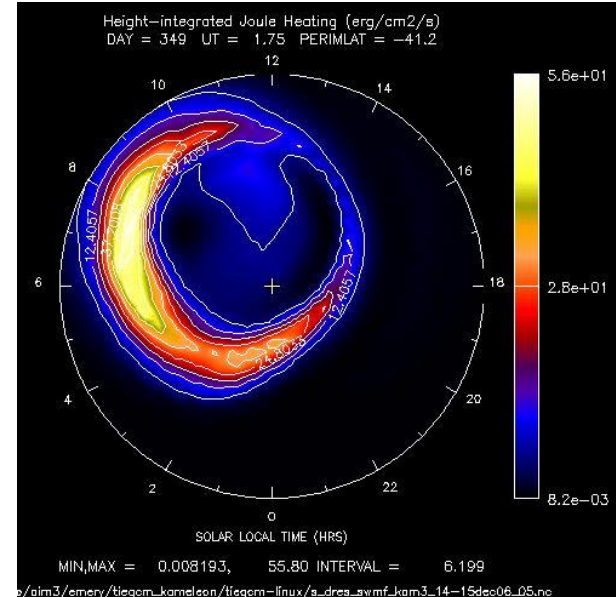
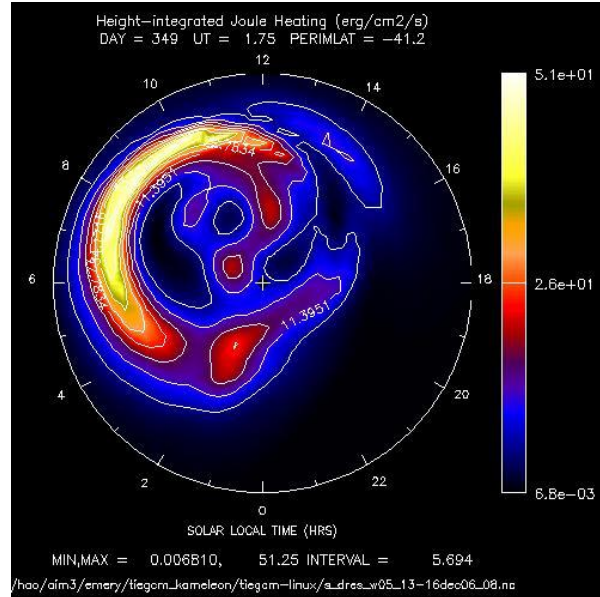
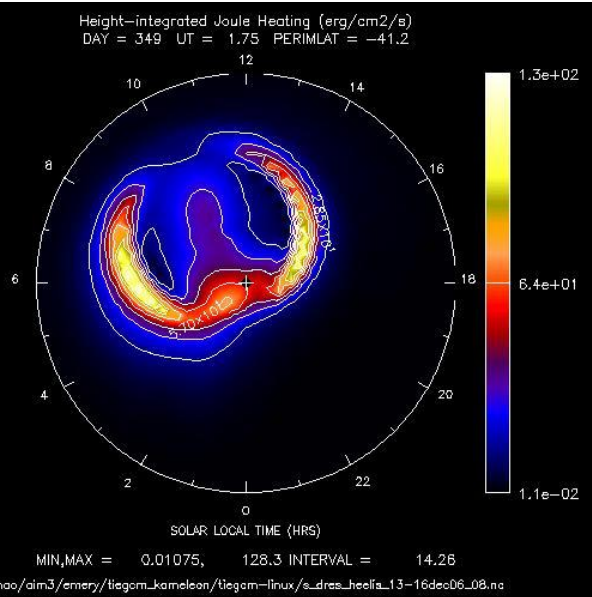
Vsw, Bz TIEGCM
322GW SH of
176GW given
(236GW NH)



SWMF 115 GW



ASTRA AMIE
(SD+mags)
130GW



Heelis Kp 193kV,442GW

Weimer05 181kV, 176GW

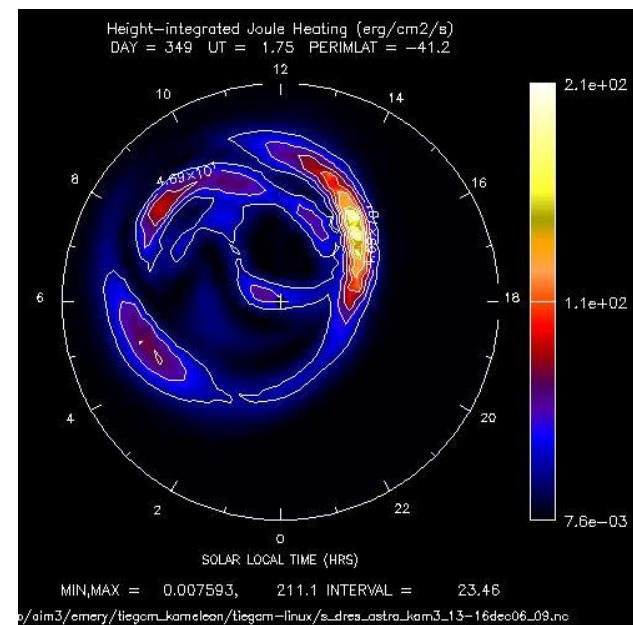
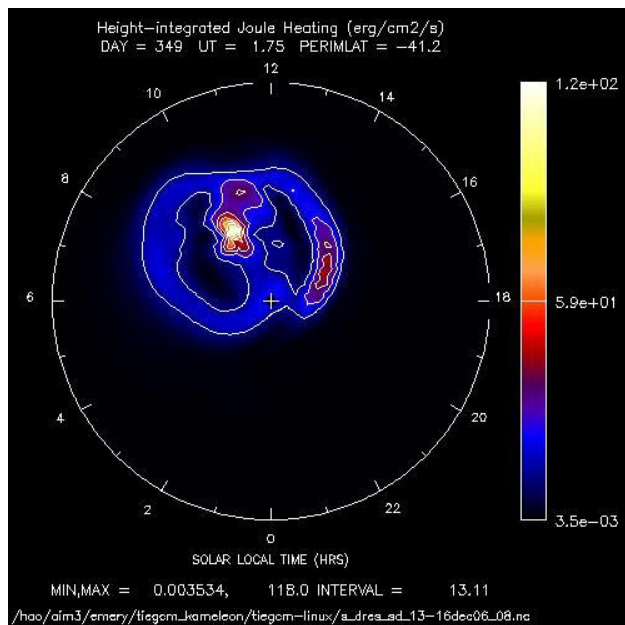
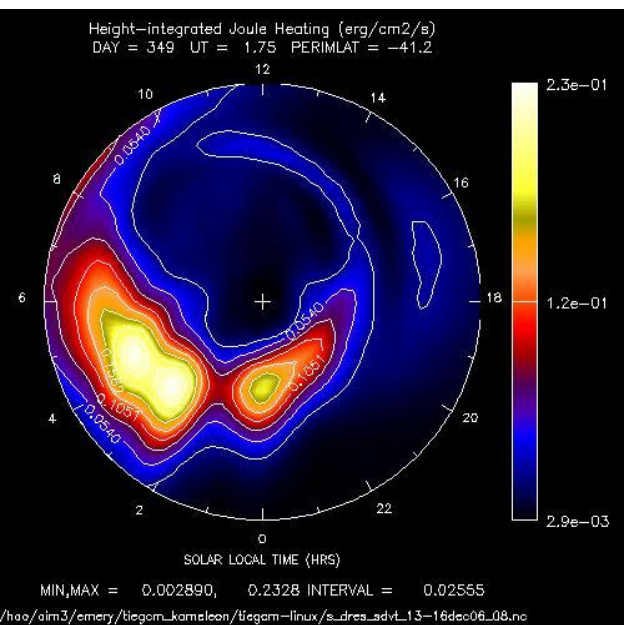
SWMF 100kV, 115GW

SH 06349 0145UT Peak QJ heating on AM or PM side or near cusp

SuperDARN VT 75kV 442GW

SuperDARN 50mlat 139kV

ASTRA AMIE 186kV, 130GW



Conclusions and Future

- CP more consistent among models than HP
- QJ from CP (Vi) and HP+EUV (SigPedersen) can peak anywhere on the oval in MLT
- SD VT data easy to get (>60mlat and is better more recently with larger number of mid-latitude stations) at <http://vt.superdarn.org/tiki-index.php?page=ASCIIData>
- TIEGCM “AMIE-type” and kameleon driver source to be released later this year (hopefully)