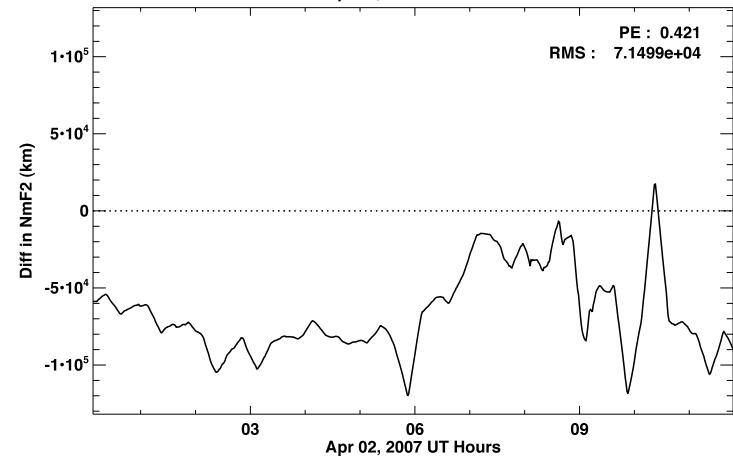
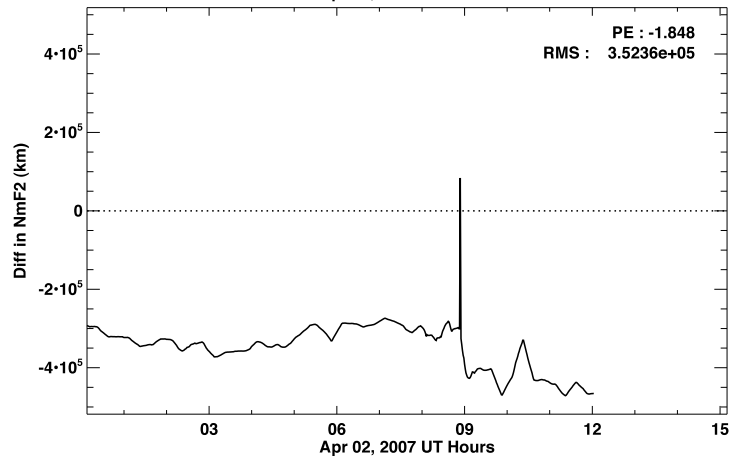
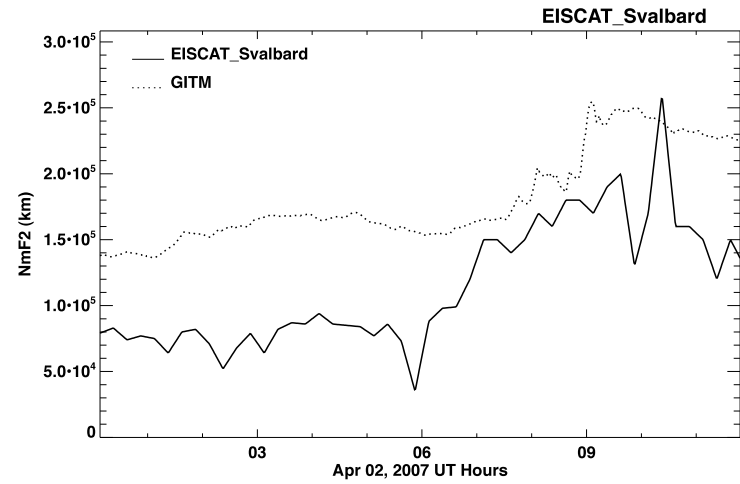
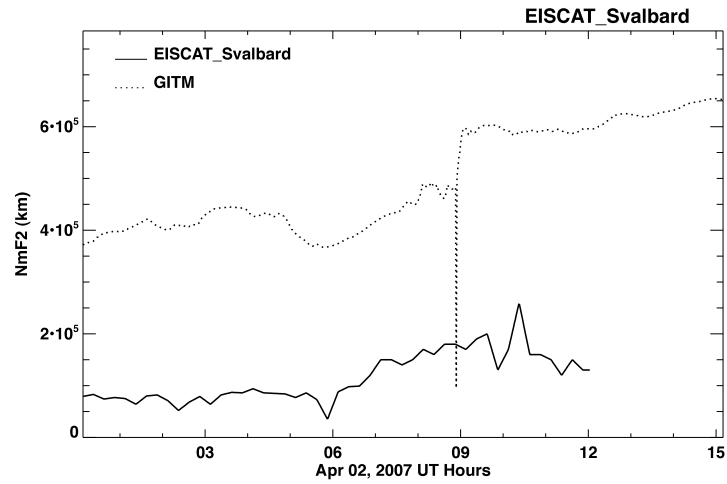


GITM Validation Studies

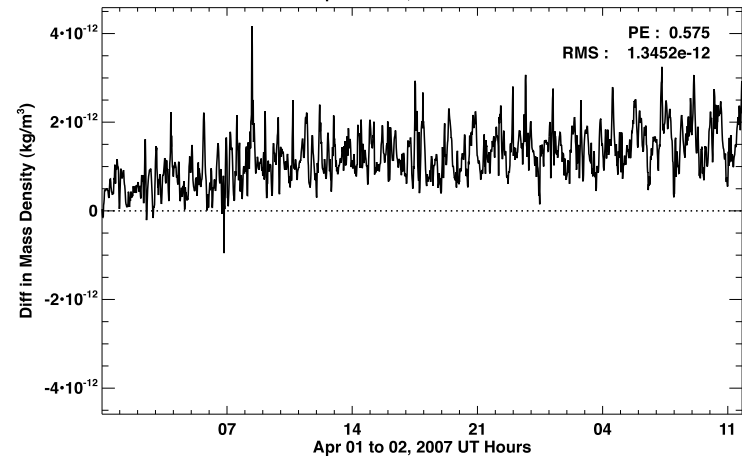
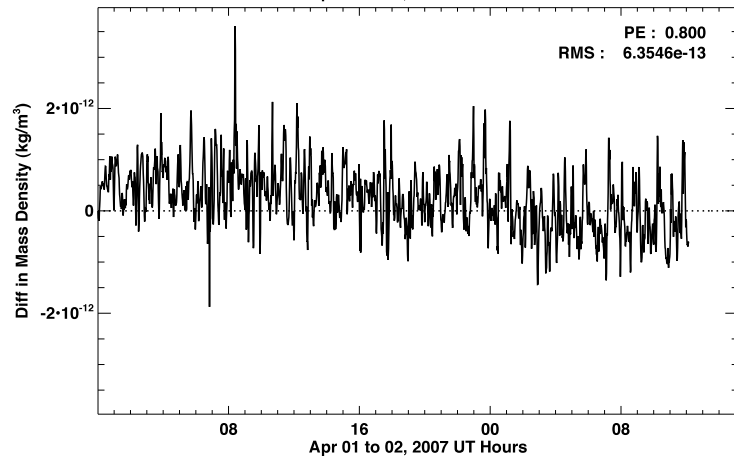
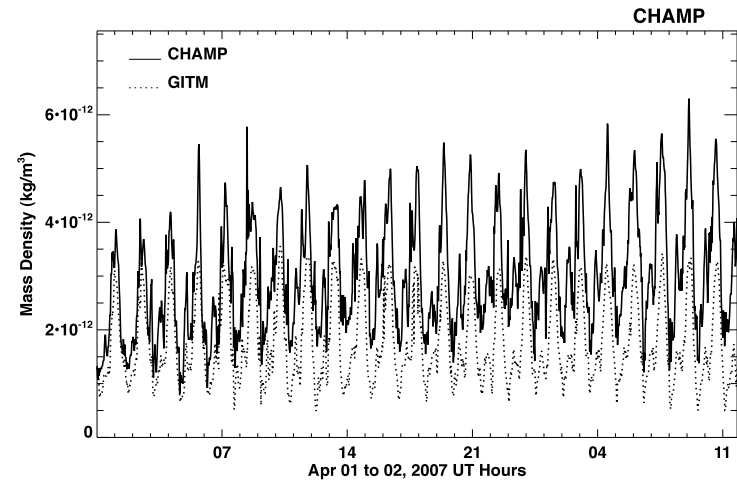
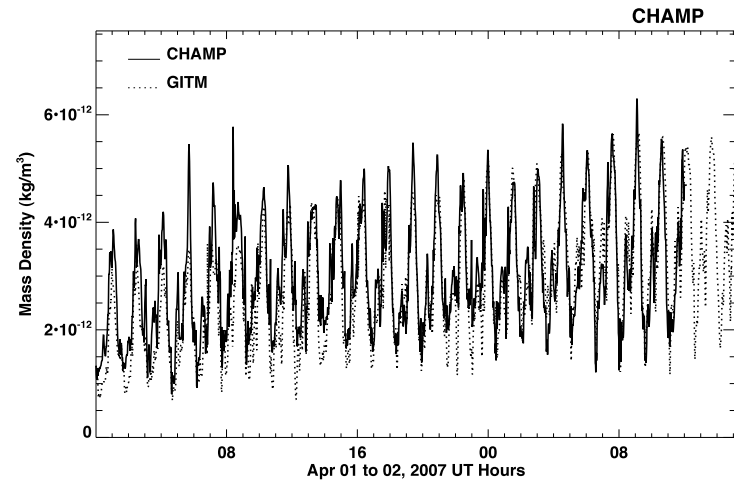
Using CCMC Events

Bad Results – Better Results



Eiscat NMF2

Good Results – Worse Results

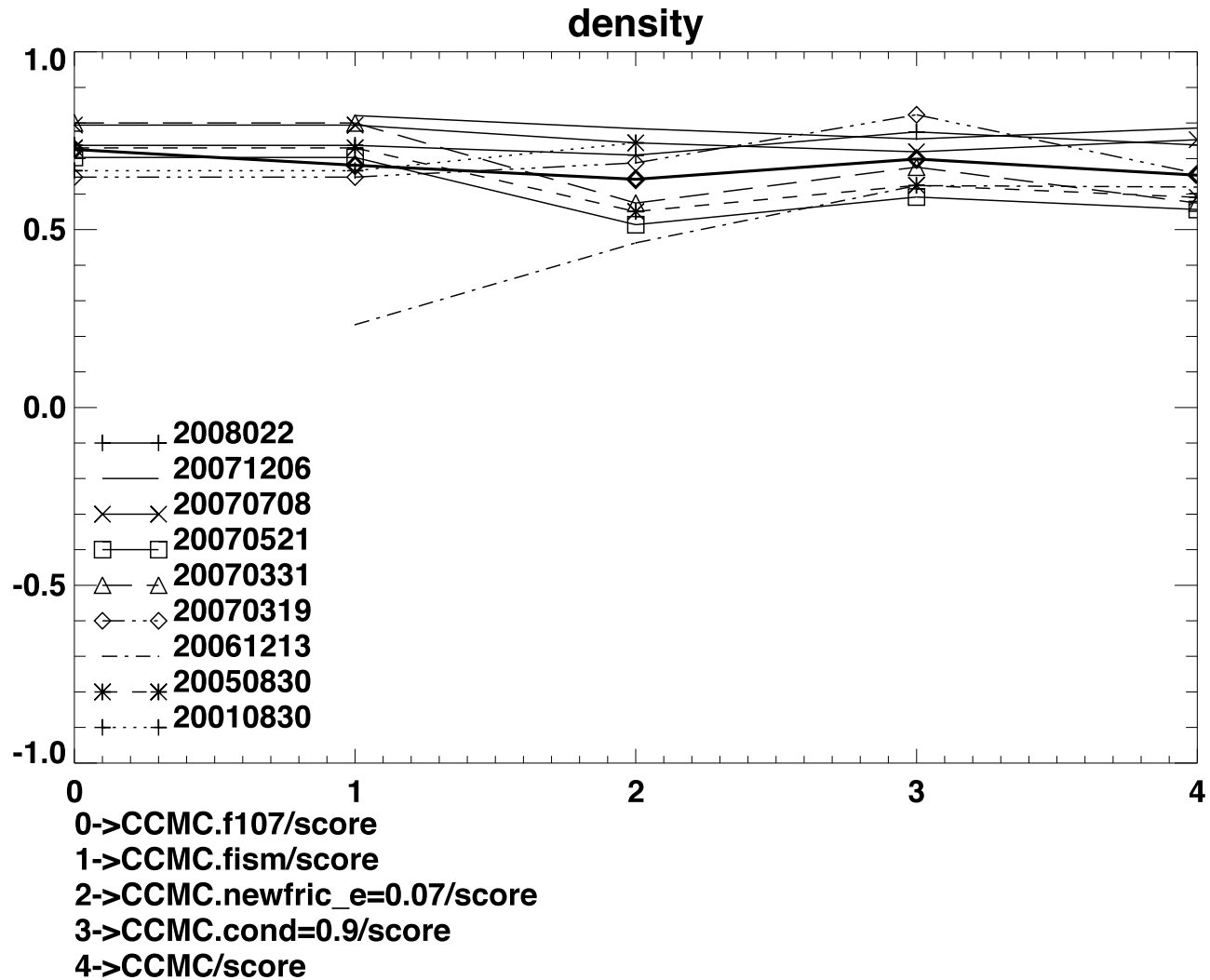


CHAMP Mass Densities

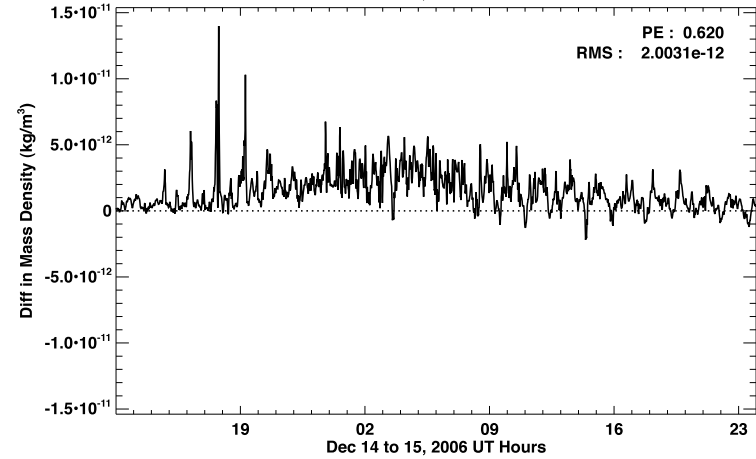
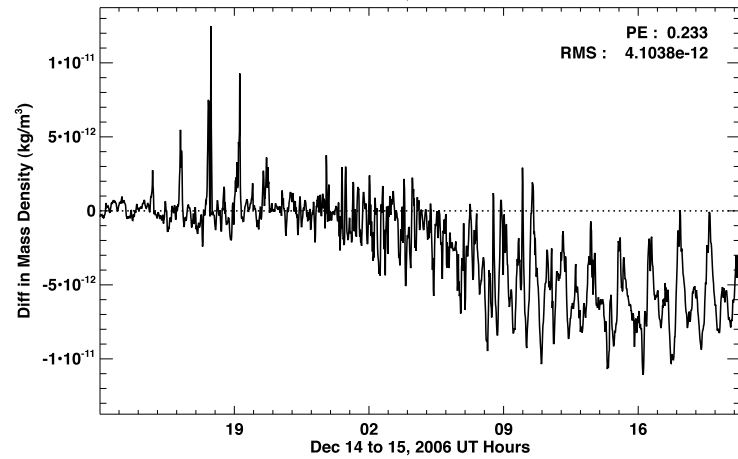
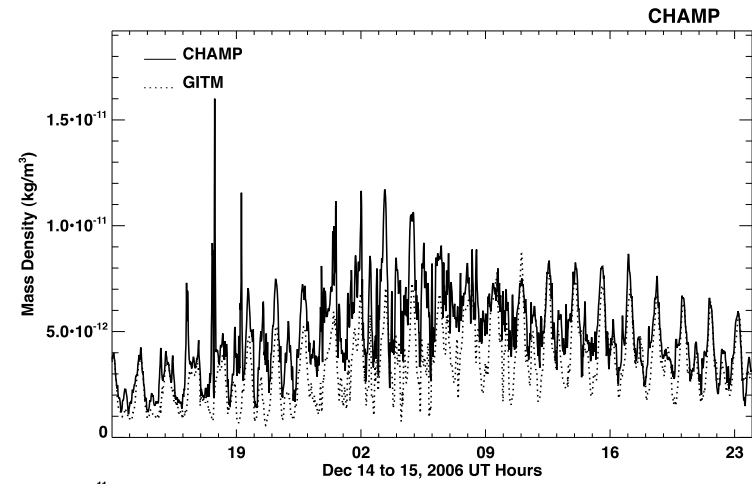
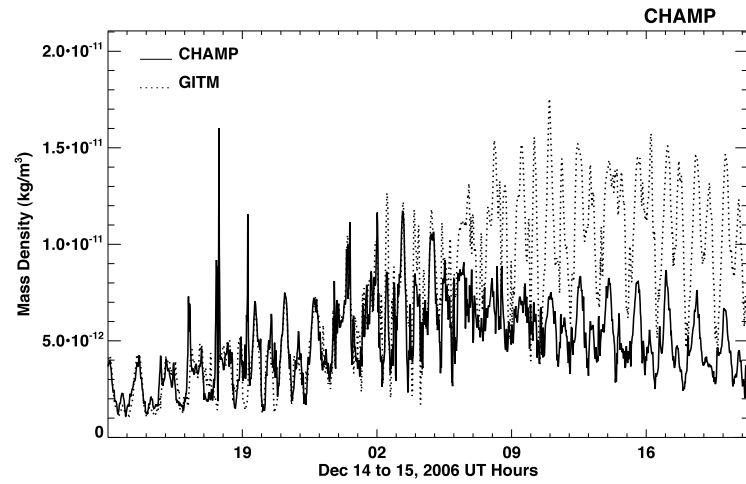
What did you do?

- F10.7 driven
 - Produced some of the worst results
- FISM
 - Produced great CHAMP results (most of the time)
 - Horrible electron density (GITM way to high!)
- When arguing about how to model Titan and Mars, we found a bug in the code in the molecular diffusion rates. This changed the diffusion significantly.
 - Had to compensate by adding more Eddy diffusion.
- This greatly improved the electron densities, but has cooled off the atmosphere too much
 - Not sure why, still investigating
 - Reduced the NO cooling
 - Increased the solar efficiency from 5% to 7%
 - Discovered that Eddy cooling was turned off by accident, which served to then cause the atmosphere to be even cooler. Crap.
 - Playing with the molecular conduction
 - Perhaps gravity wave heating?

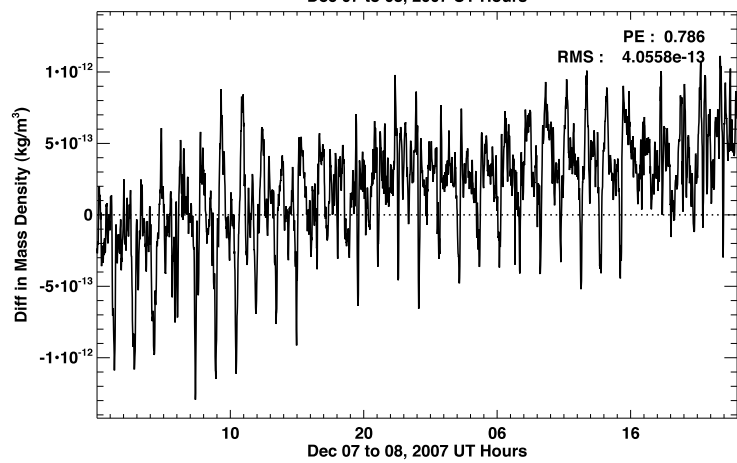
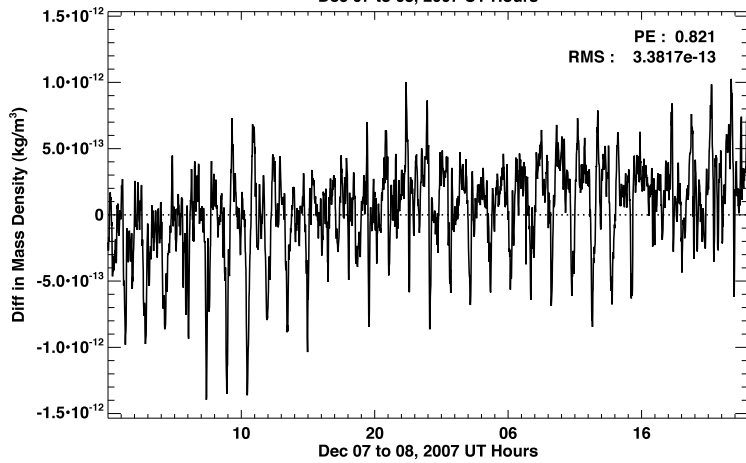
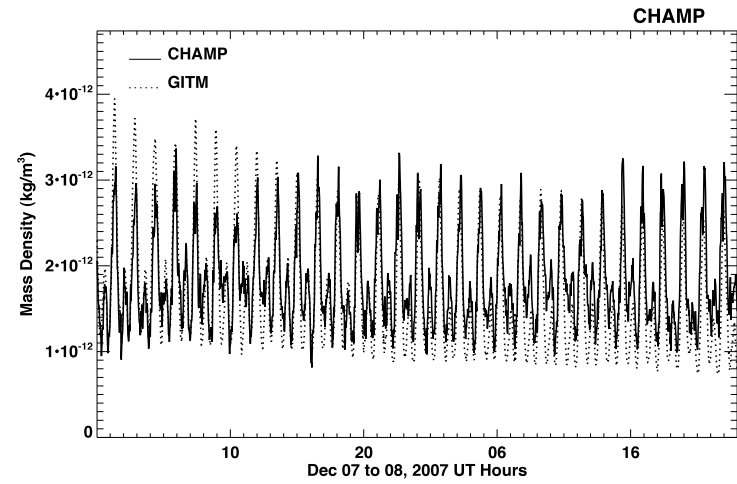
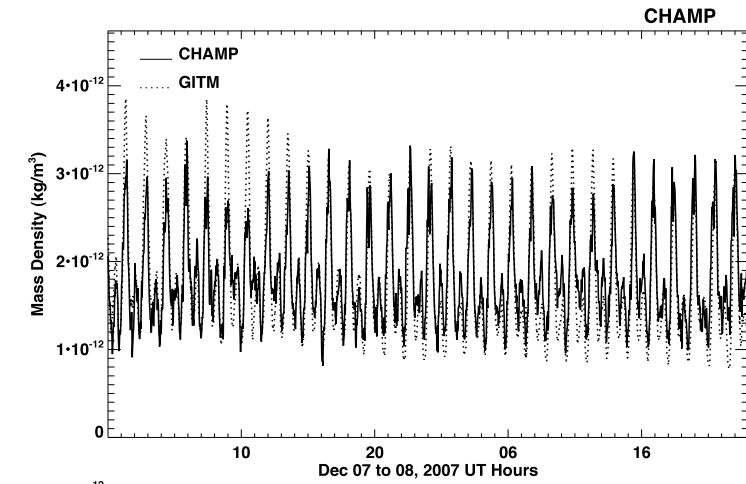
Prediction Efficiency



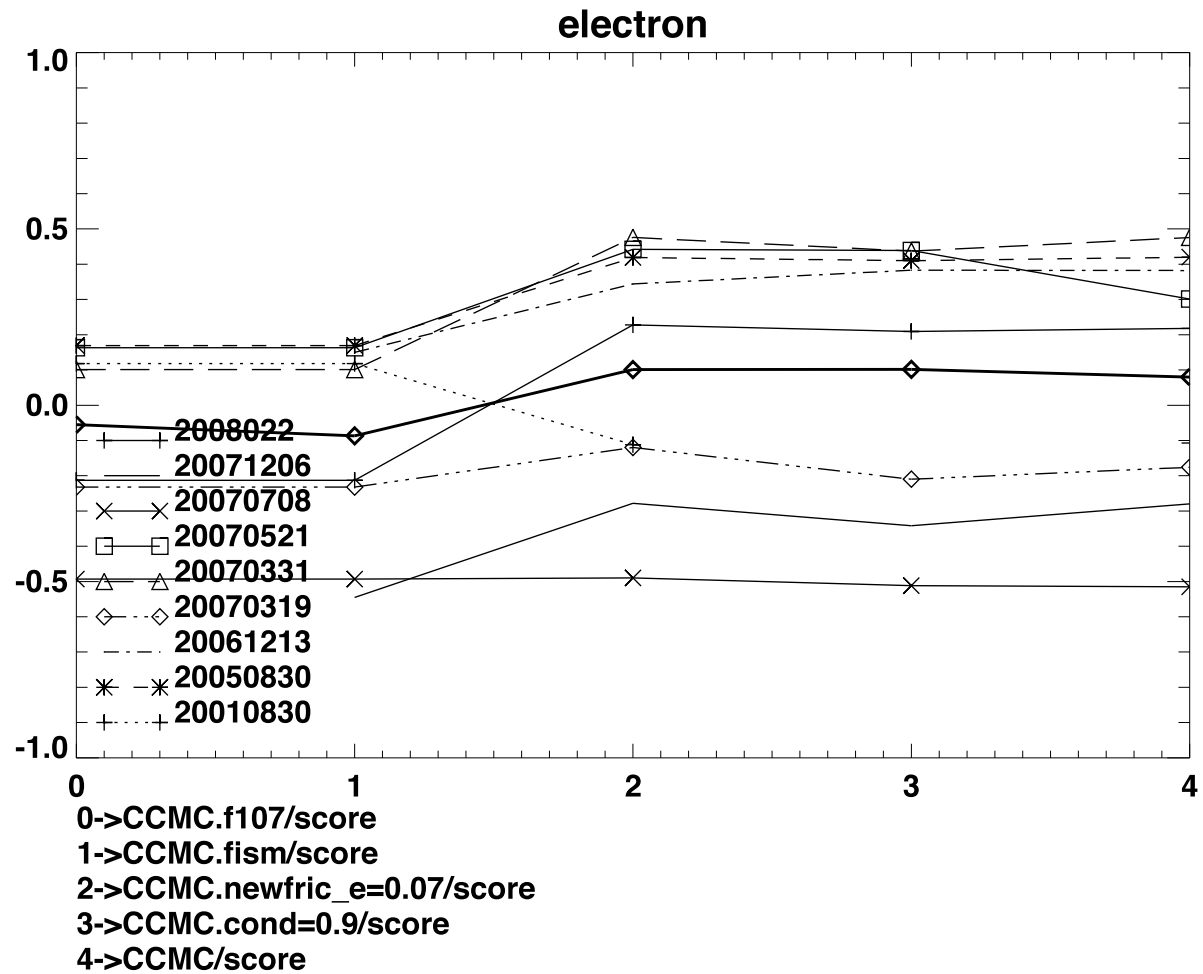
Old on Left, New on Right



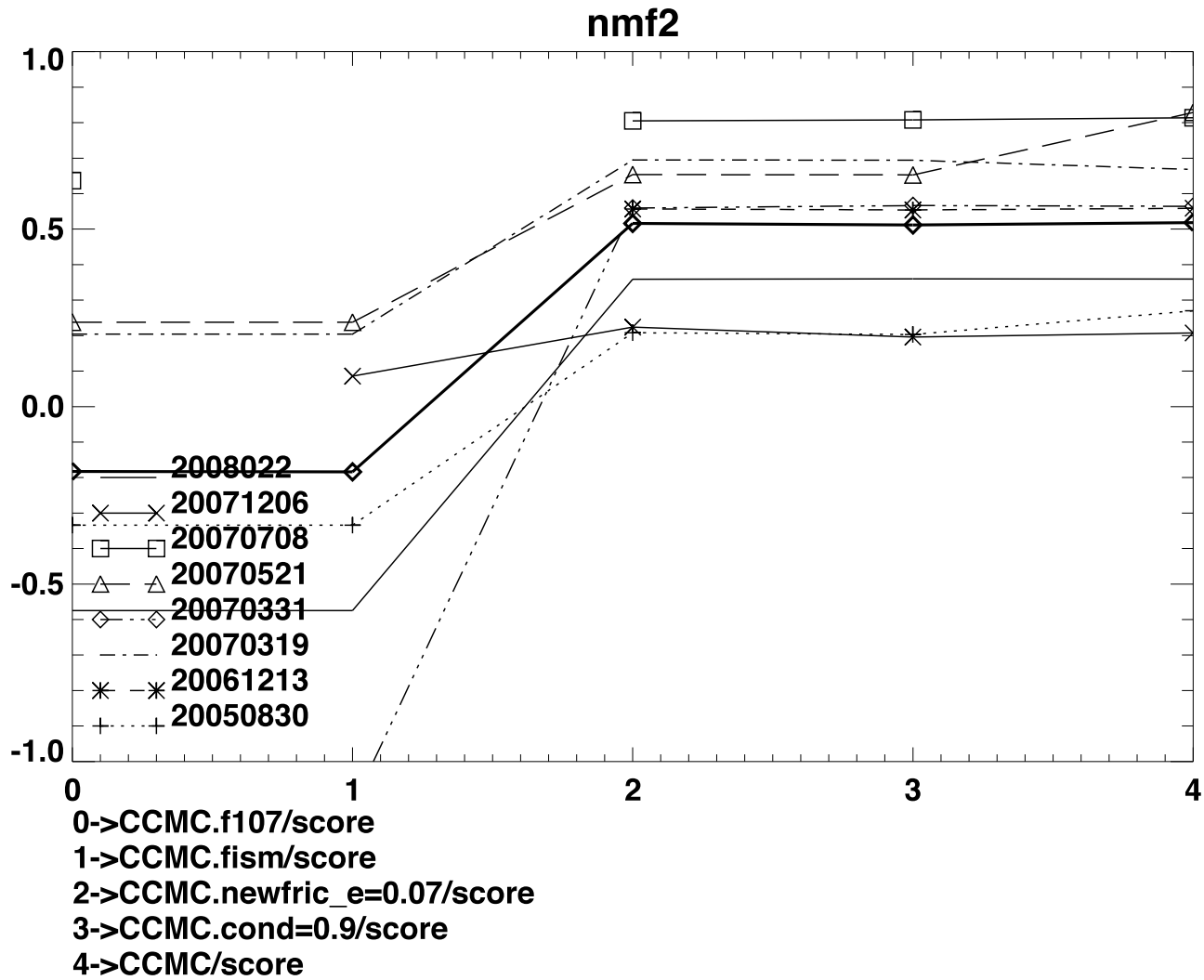
Old and New



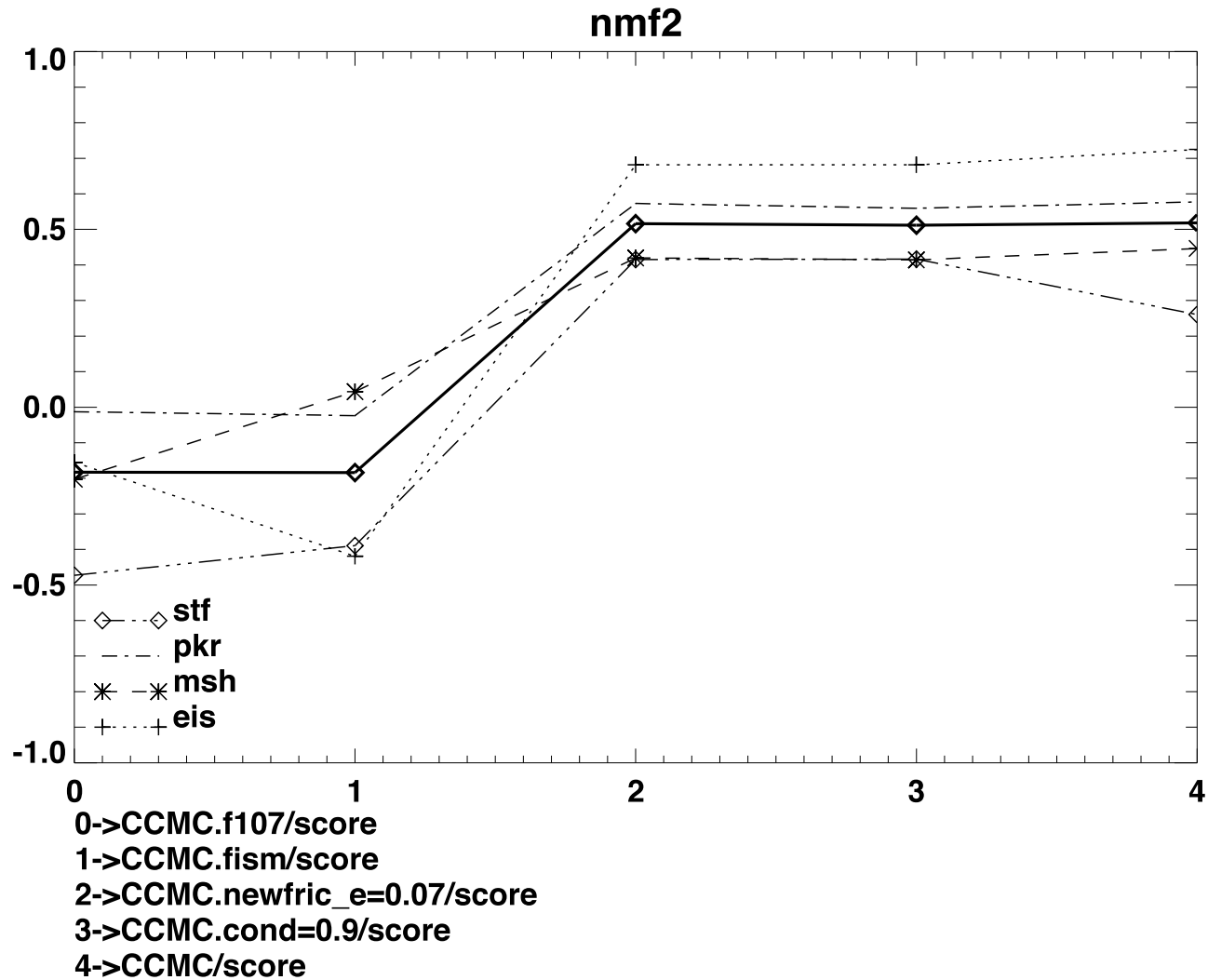
CHAMP Electron Density



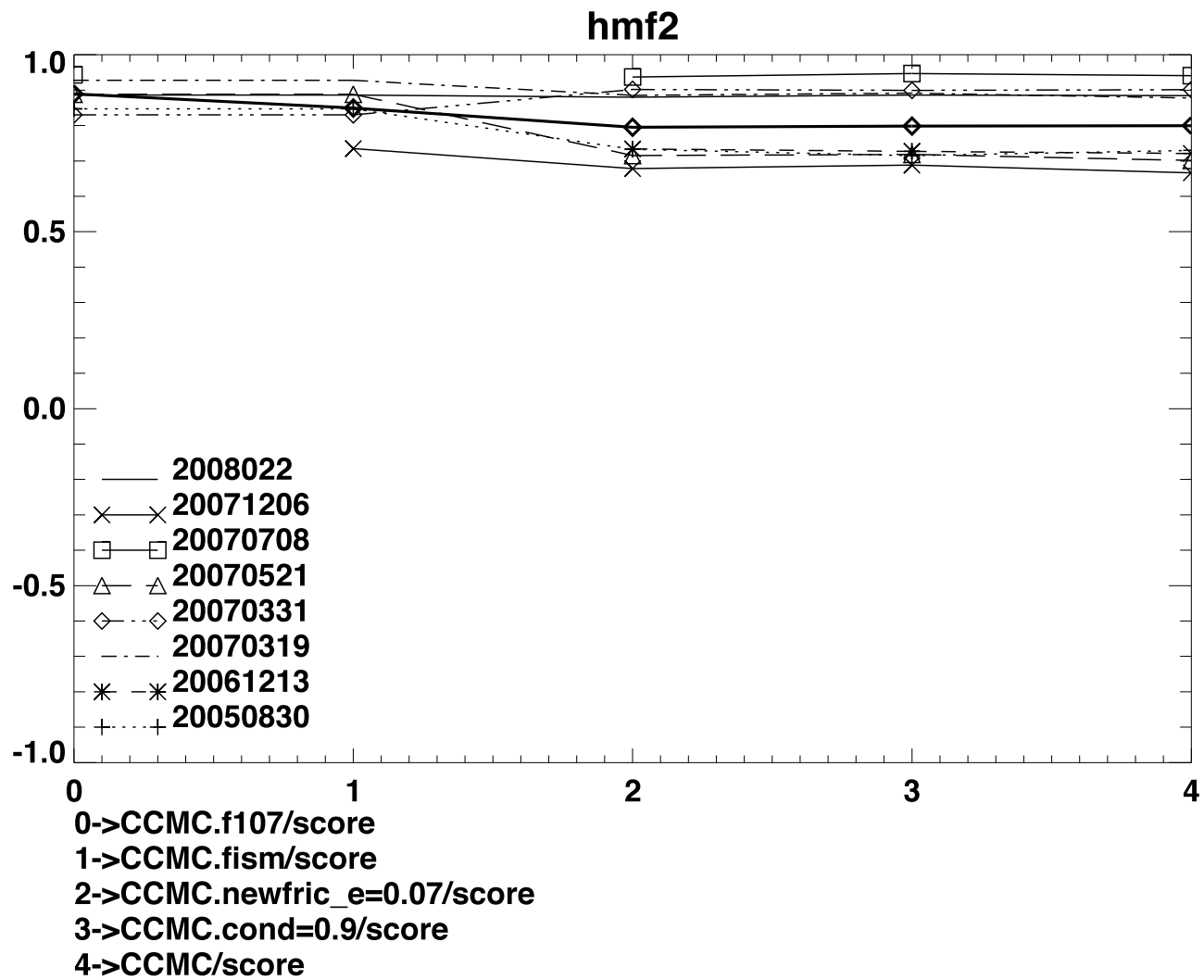
NMF2 from Radars (stations averaged)



NMF2 by station (events averaged)

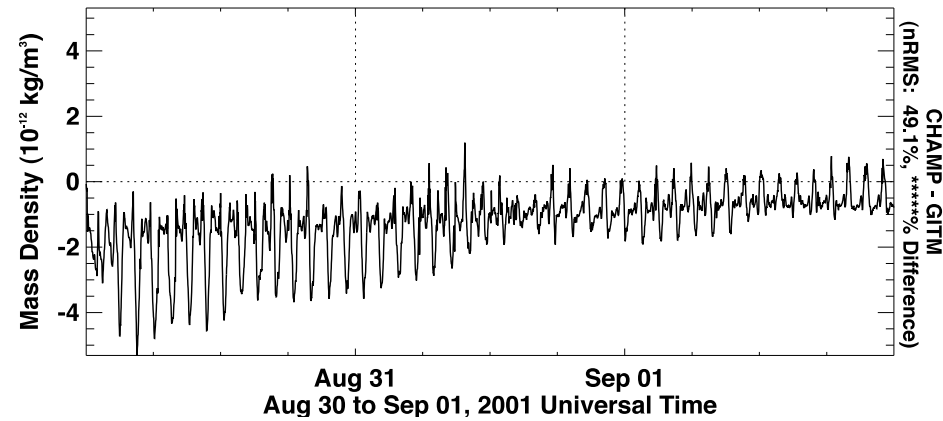
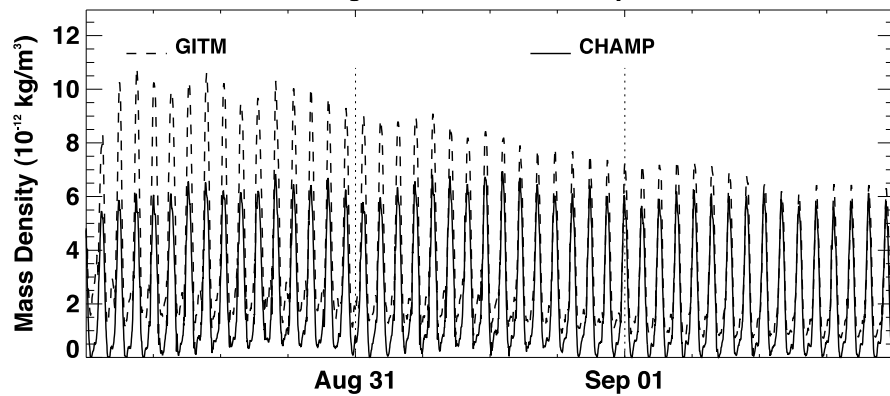


HMF2 for Radars

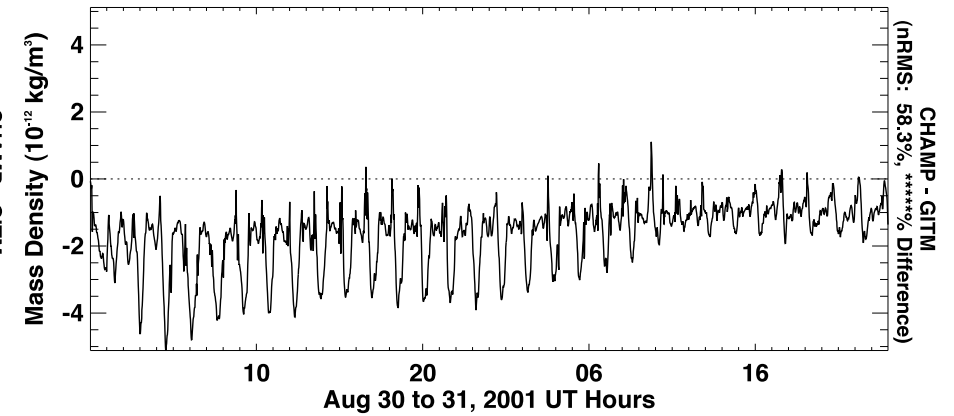
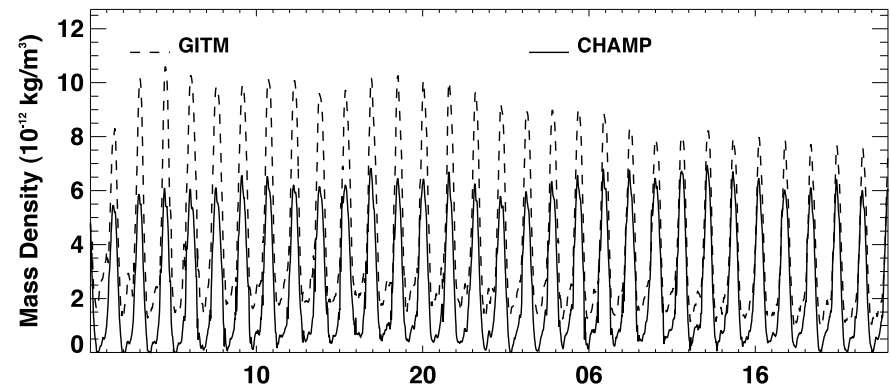


August 2001

Weimer driven

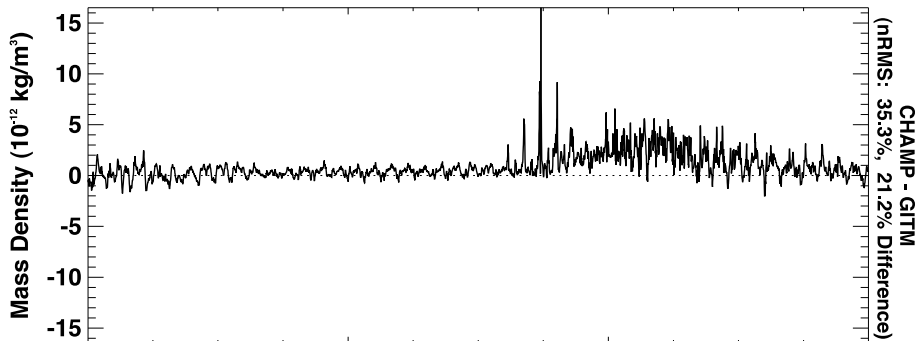
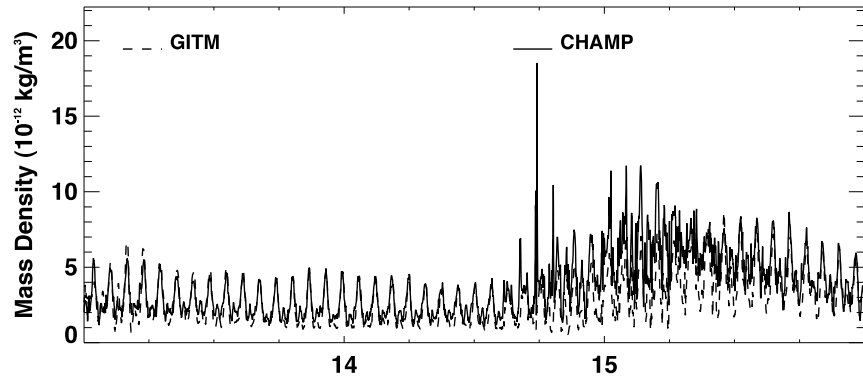


AMIE Driven



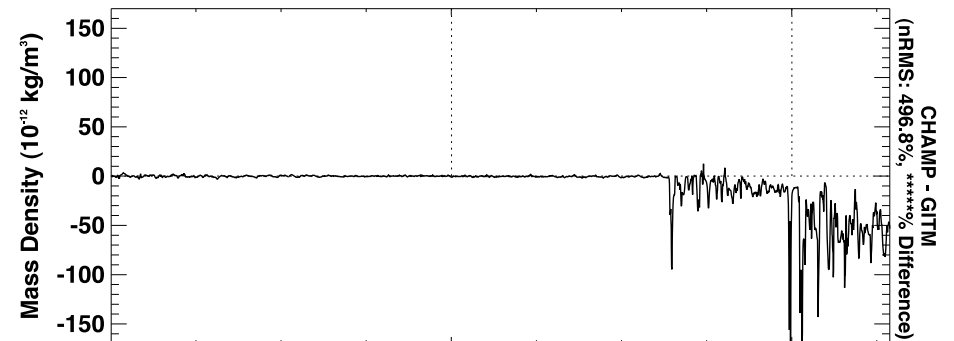
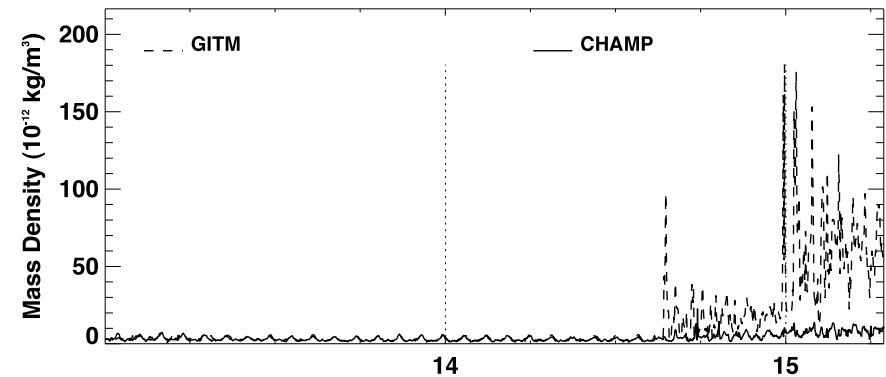
December 2006

Weimer Driven



Dec 13 to 15, 2006 Universal Time

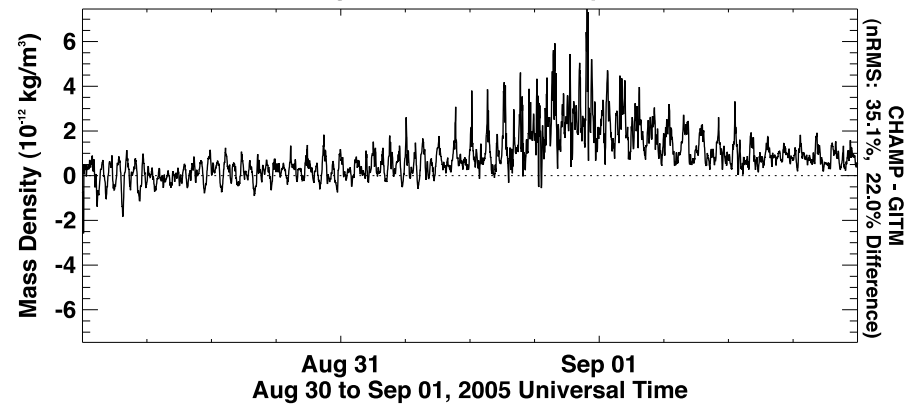
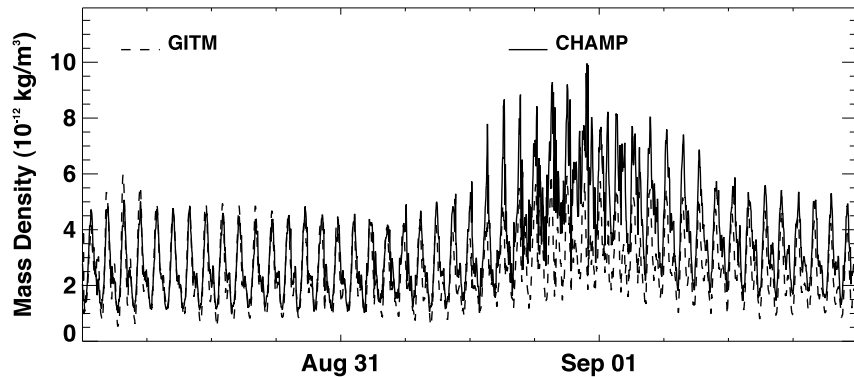
AMIE Driven (something wrong...)



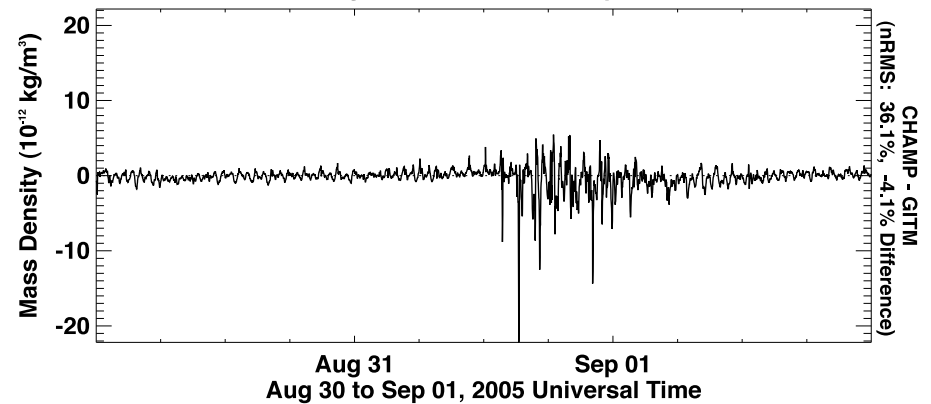
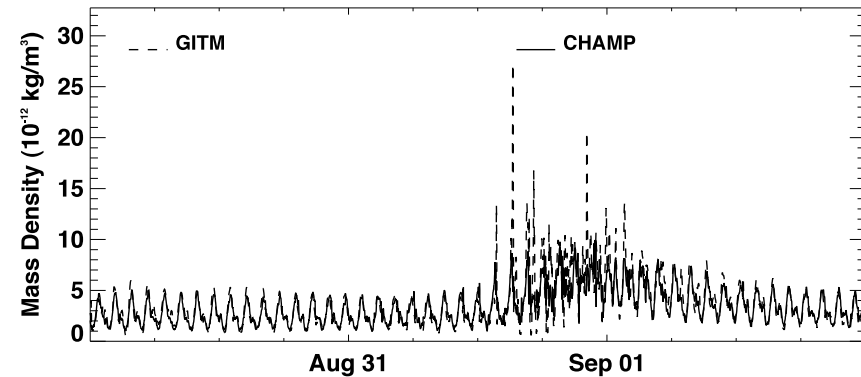
Dec 13 to 15, 2006 Universal Time

August 2005

Weimer Driven



AMIE Driven



Conclusions

- Fixing the diffusion in GITM has dramatically helped the electron density
- It has also caused the atmosphere to be a little too cool (or, have too little mass density at 400 km altitude)
- But, the prediction efficiencies of the NMF2 have increased dramatically!
 - GITM seems to have a real ionosphere now....
 - Although, the low latitude electrodynamicss are now a bit too strong (which is why the CHAMP electron densities did not improve dramatically).
- Using AMIE sometimes is better and sometimes is worse. Need to explore more events.