Weddell Sea Anomaly
The IT CISM Team
Zenith Angle Controlled Ne
Ne at the F2 Peak

UT 12: 0 June solstice ideal case  z=+2  Day 1
Weddell Sea Anomaly (1958)

Bellchambers and Piggott (1958)
COSMIC
(Constellation Observing System for Meteorology, Ionosphere, and Climate)
Cosmic NmF2 around the December Solstice

Burns et al. J. Geophys, 2008

19-20 LST
COSMIC NmF2

Burns et al. J. Geophys, 2008
TOPEX/Poseidon
Longitude Variations of Ne at 55 S

March  June  September  December

Noon  Midnight
Conclusions

- The Weddell Sea anomaly does not appear in CMIT/NCAR-TIEGCM.
- Therefore, some physics or chemistry is missing from the model. Some possible mechanisms are:
  1) Neutral winds
  2) Electric Fields
  3) Particle diffusion from above
TOPEX TEC

March

June

September

December

Noon  midnight  Noon  midnight
TOPEX TEC 50-66 S (3.75 longitude bin)

Min

Max

Jee et al. 2008
The Normal Ionosphere

Lei et al., 2007
Seasonal and Solar Cycle Variations

- Jee et al. study uses TOPEX data
- Solar cycle variations
- Seasonal variations with solar cycle