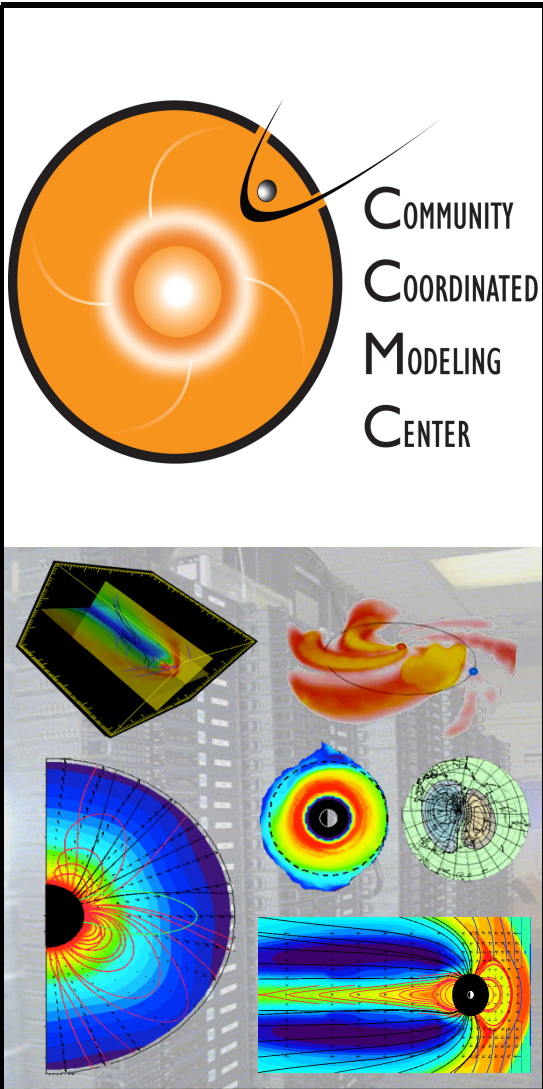




TEC and Ne Changes during 2006 Dec. Storm

CCMC : J. Shim, M. Kuznetsova, L. Rastätter

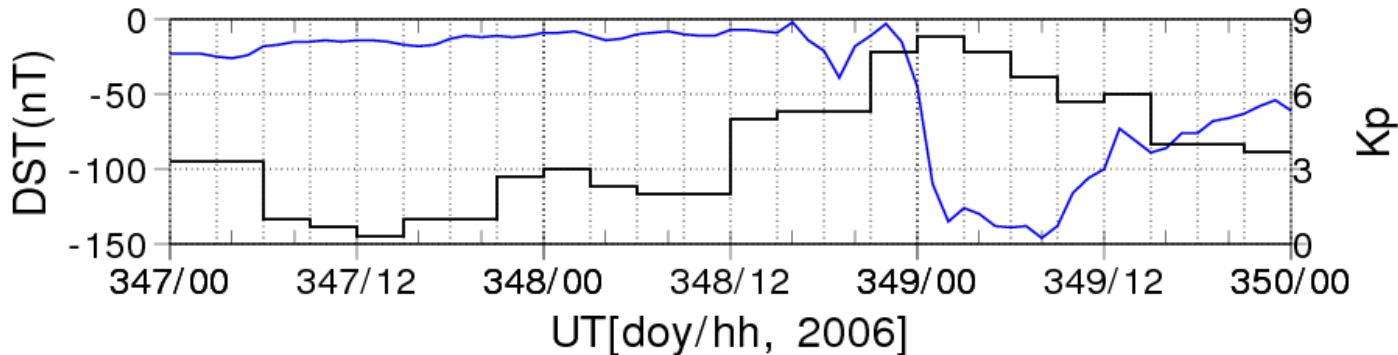
Data providers : A. Coster, L. Goncharenko

<http://ccmc.gsfc.nasa.gov>

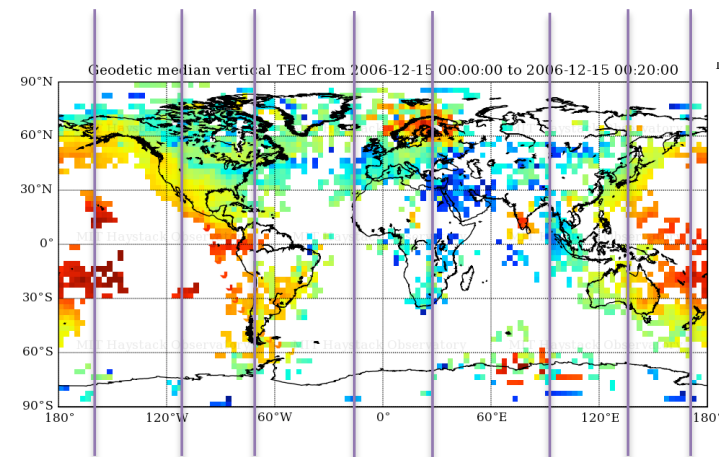
NASA Goddard Space Flight Center



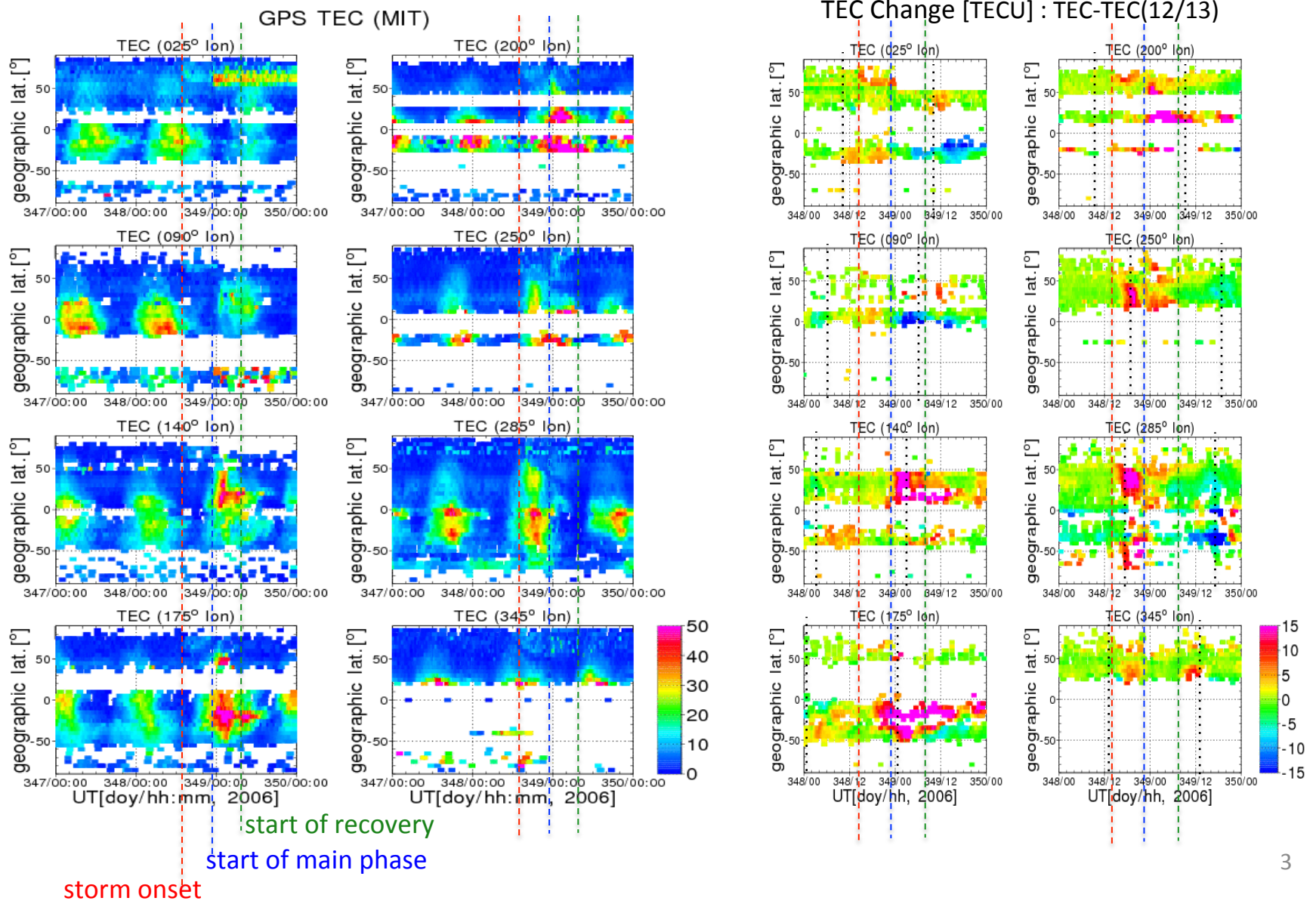
- Time interval
: 2006/12/13 (doy 347) 00:00 UT - 12/15 (doy 350) 00:00 UT
- Dst and Kp indices during the time interval



- Global TEC in eight longitude sectors
: 025-030, 090-095, 140-145, 175-180,
200-205, 250-255, 285-290, 345-350
- Ne along the CHAMP orbits



Observed TEC and TEC Changes

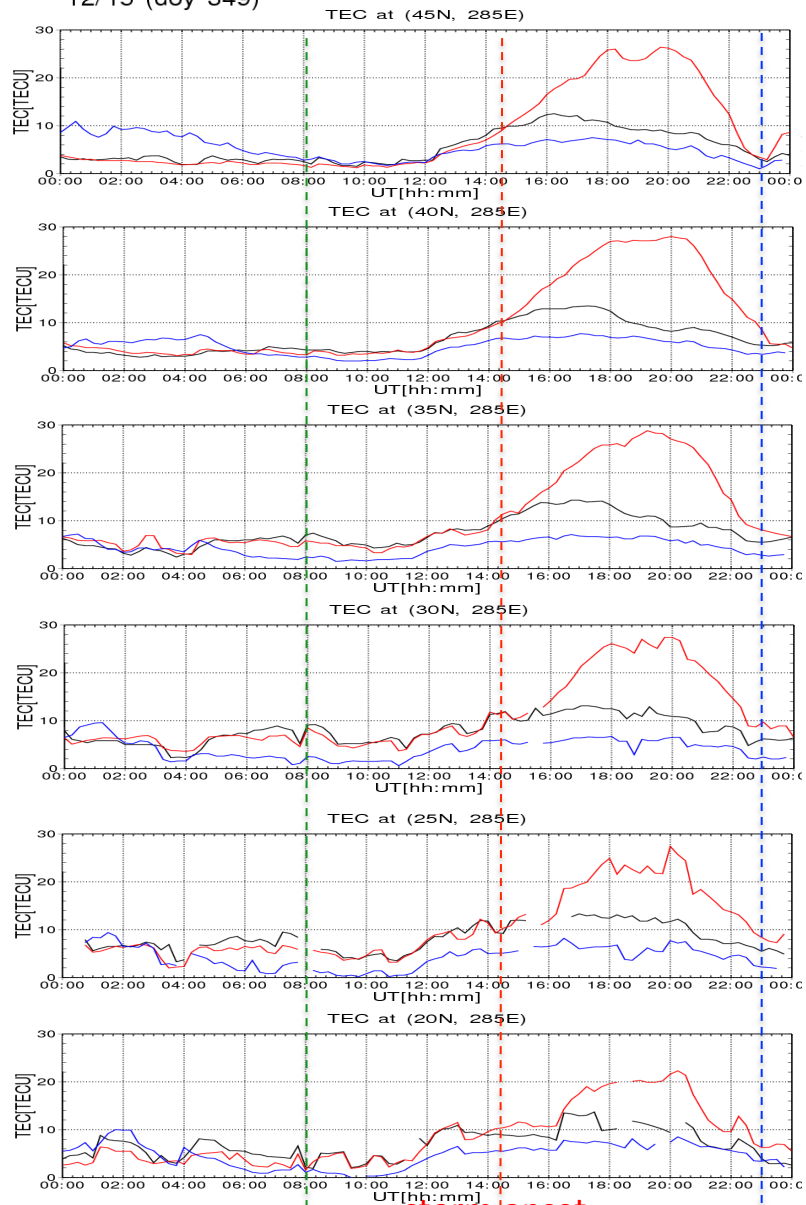


— 12/13 (doy 347)
— 12/14 (doy 348)
— 12/15 (doy 349)

TEC [TECU]

285°E longitude sector

TEC Changes [%] : $\frac{\text{TEC}-\text{TEC}(12/13)}{\text{TEC}(12/13)} \times 100$



storm onset

start of main phase

start of recovery

45°N

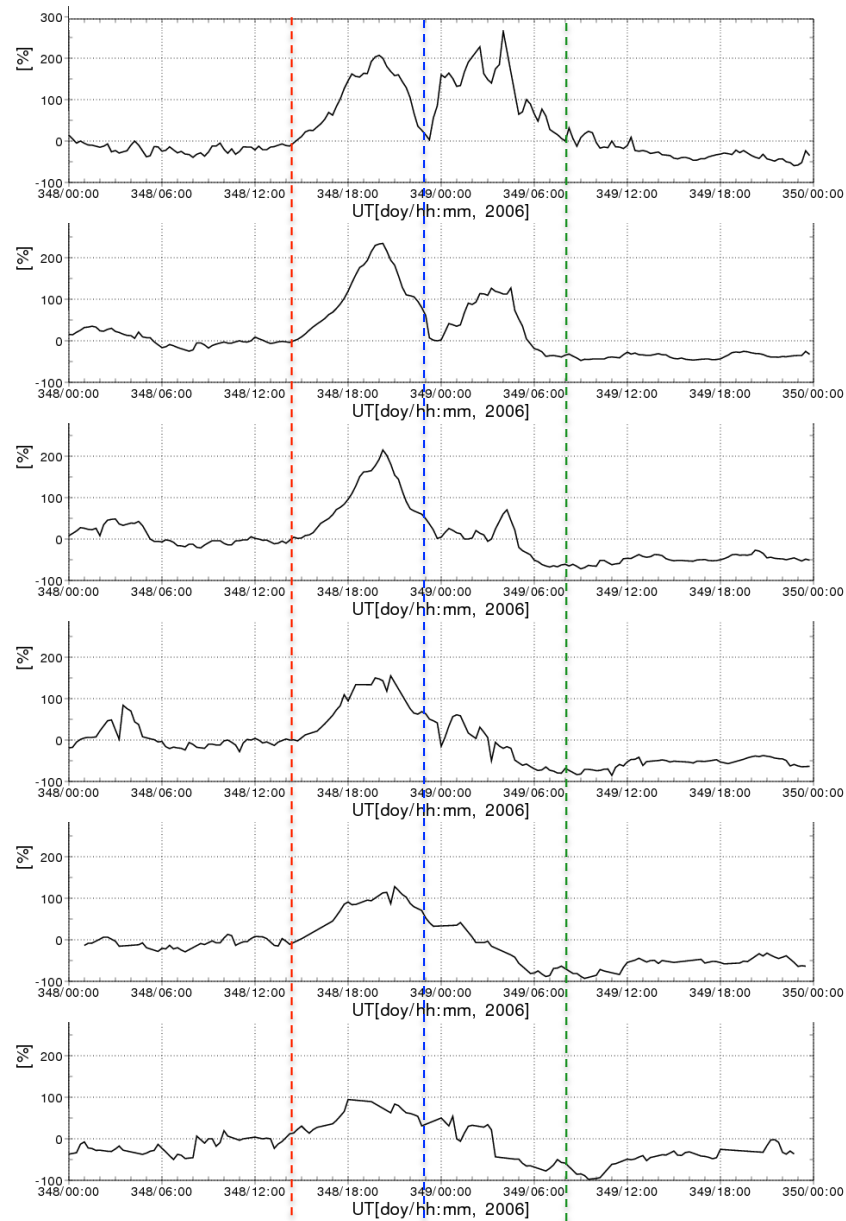
40°N

35°N

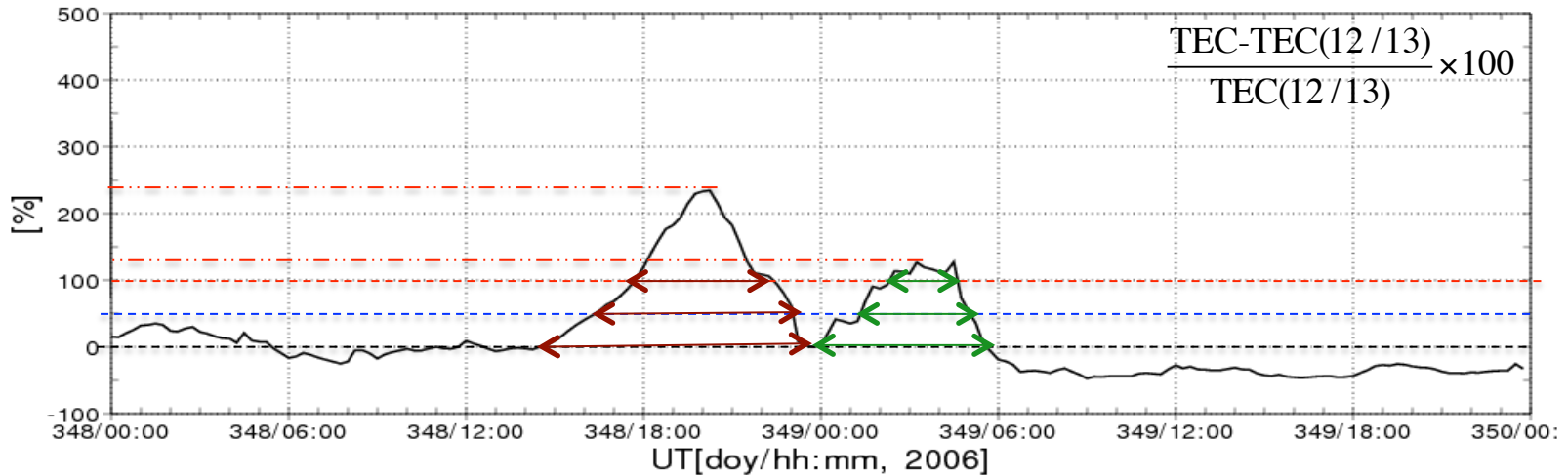
30°N

25°N

20°N

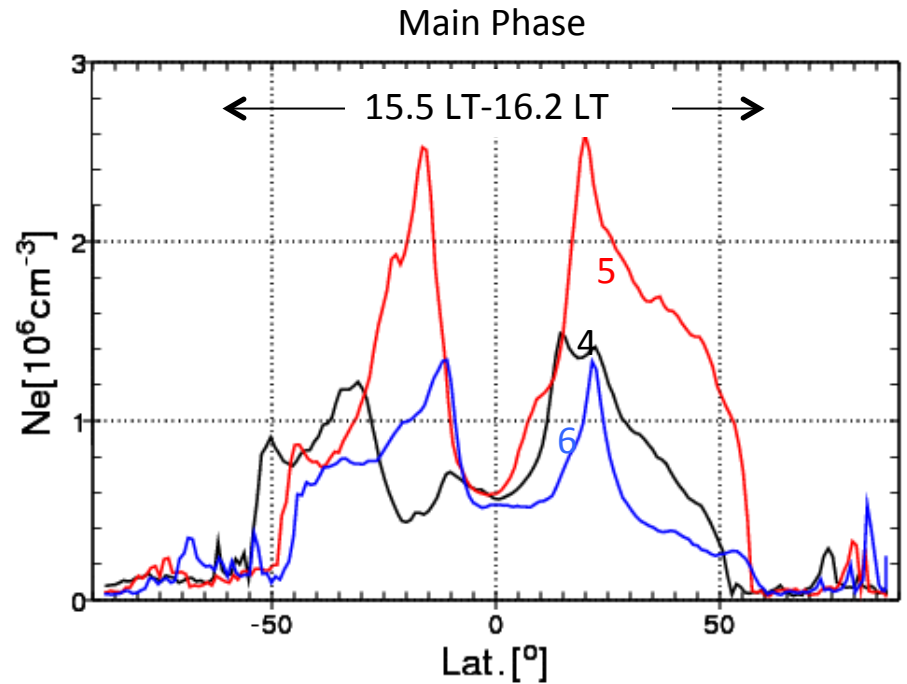
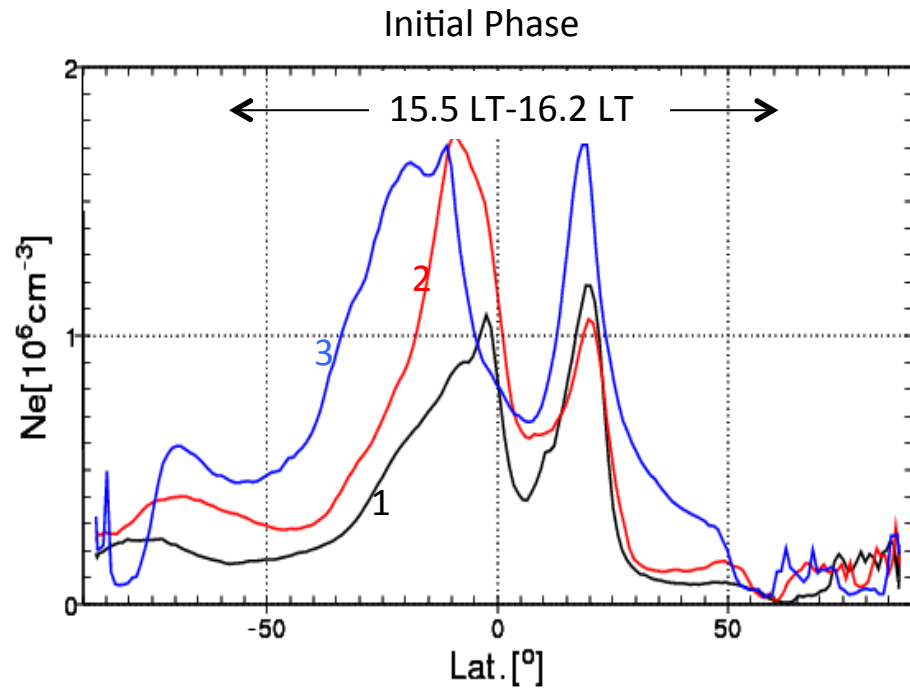
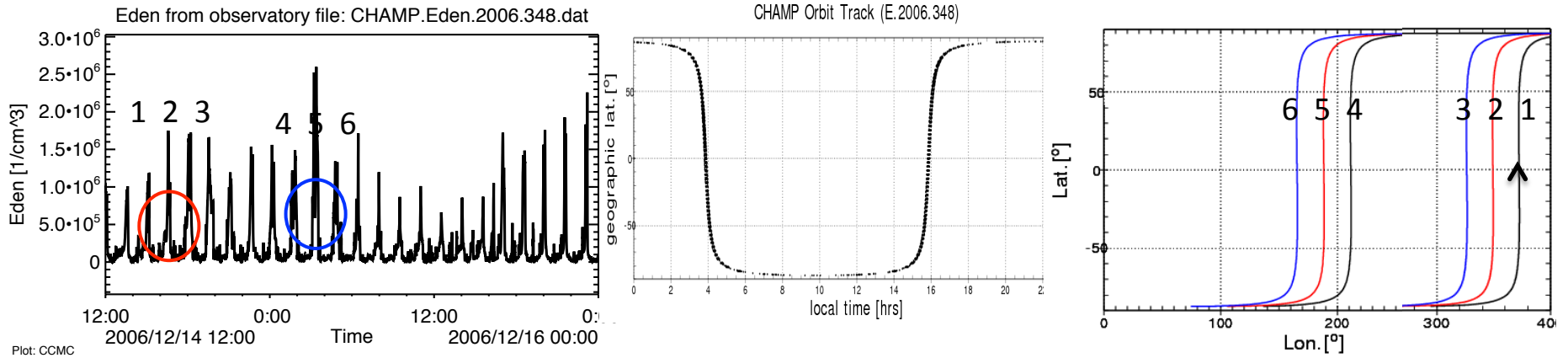


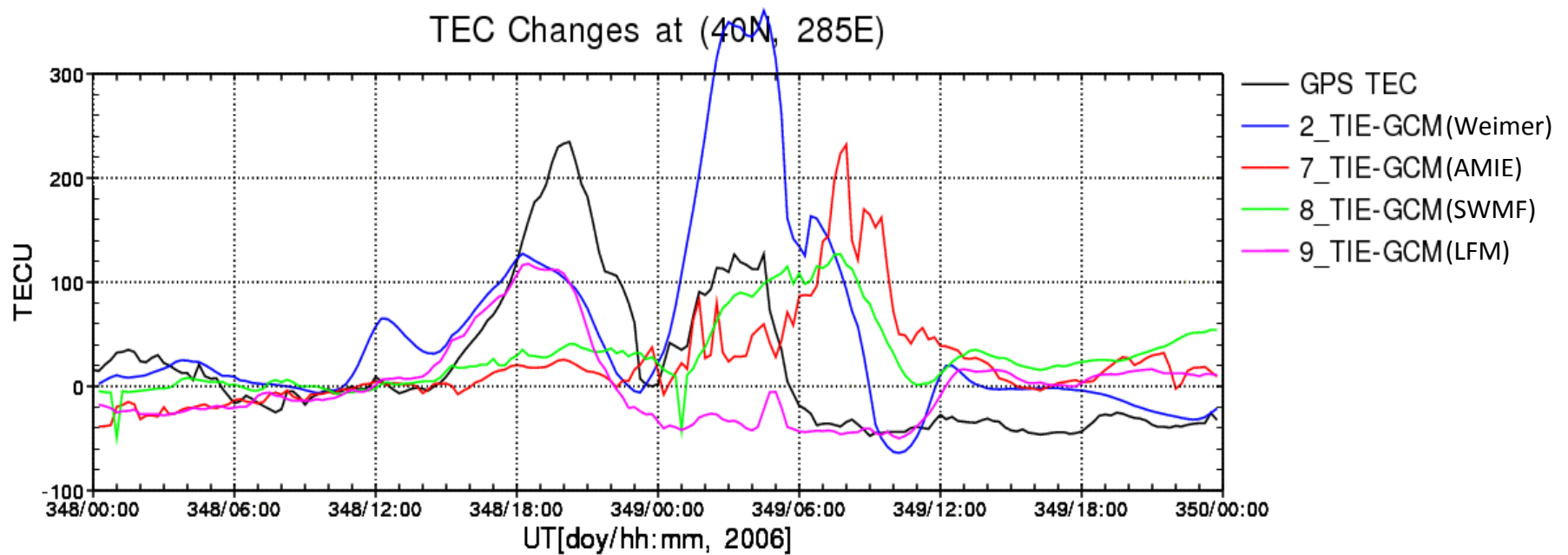
Relative TEC Changes [%] : at (40N, 285E)



- Parameters to quantify storm effects on TEC:
 1. Peak value (e.g., 240%, 130%)
 2. Time interval for 50/100/200 % increase (e.g., 7hrs, 5hrs, 2hrs)
 3. Time to reach the peak from 0 % (e.g., 348/20:15, 349/04:30)
 4. Rate of increase (e.g., 240%/5hrs)
 5. etc.

Electron density at the CHAMP location





	Peak		Peak time		Duration (50%)		Duration (100%)	
	initial	main	initial	main	initial	main	initial	main
GPS-TEC	235 %	127 %	348/20:15	349/04:30	6h 30m	3h 40m	4h 45m	2h 20m
2_TIE-GCM	127 %	361 %	348/15:00	349/04:30	6h 10m	8h	3h	7h
7_TIE-GCM	26 %	232 %	348/20:00	349/08:00	0	4h 30m	0	3h
8_TIE-GCM	41 %	127 %	348/20:15	349/07:45	0	7h 15m	0	3h 45m
9_TIE-GCM	118 %	16 %	348/18:30	349/13:00	5h 15m	0	2h 30m	0

Summary and Discussion

- Storm effects on TEC depend on latitude, longitude and phase of storm
- Possible parameters to quantify storm effects on TEC and Ne:
 - Peak value
 - Time interval for 50/100/200 % increase
 - Time to reach the peak from 0 %
 - Rate of increase
 - etc.
- Data coverage