The Abdus Salam
International Centre for Theoretical Physics

United Nations
Educational, Scientific and
Cultural Organization

IAEA
International Atomic Energy Agency

SMR 2333-38

Workshop on Science Applications of GNSS in Developing Countries (11-27 April), followed by the: Seminar on Development and Use of the Ionospheric NeQuick Model (30 April-1 May)

11 April - 1 May, 2012

Physical Interpretation of TEC Values Measured with GPS Receivers

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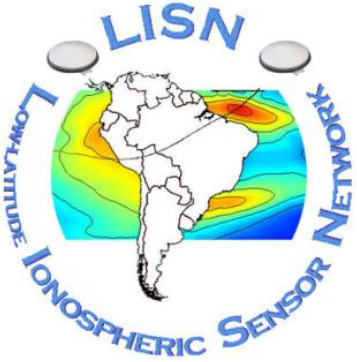
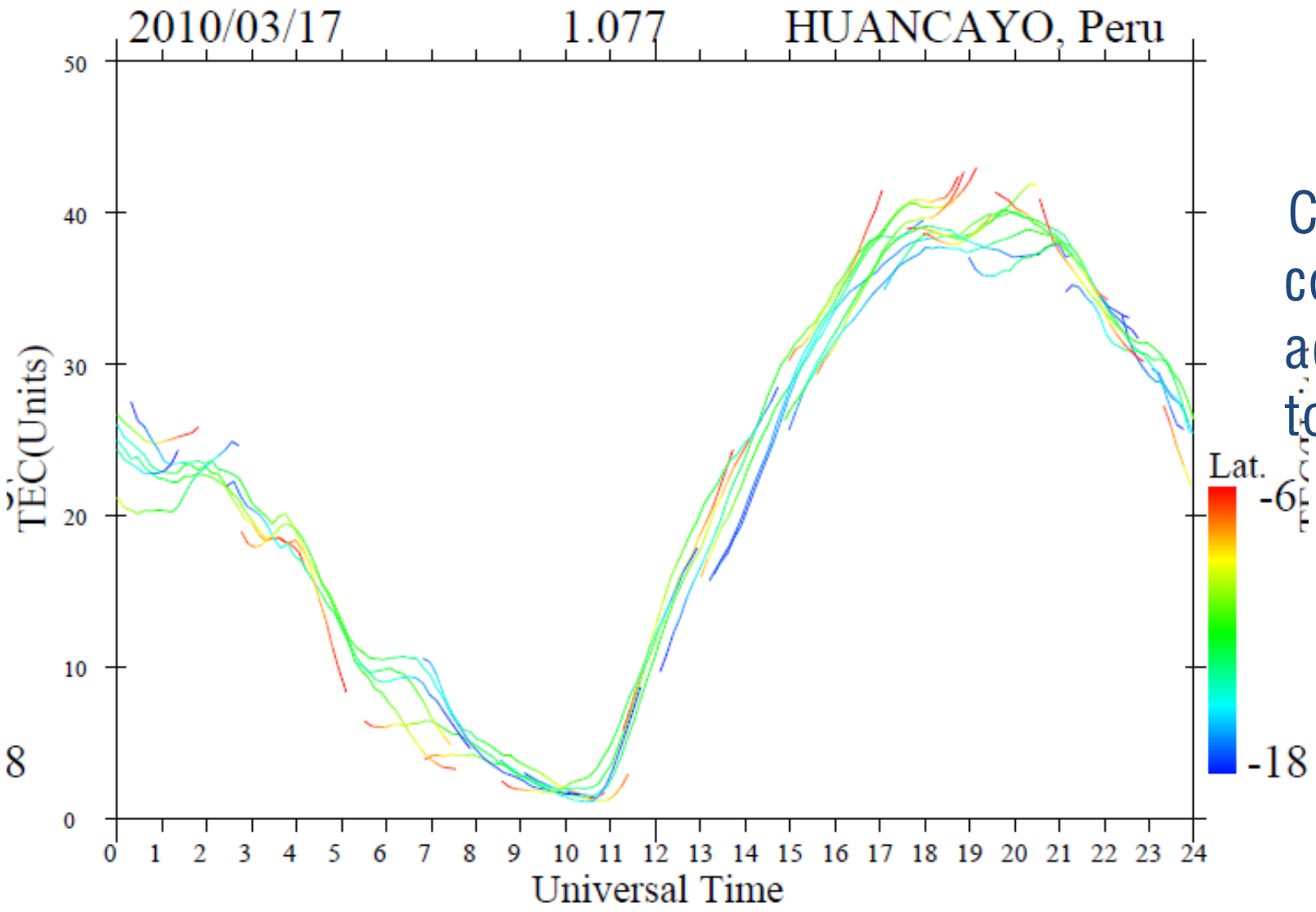
U.S.A.



Physical Interpretation of TEC values Measured with GPS receivers

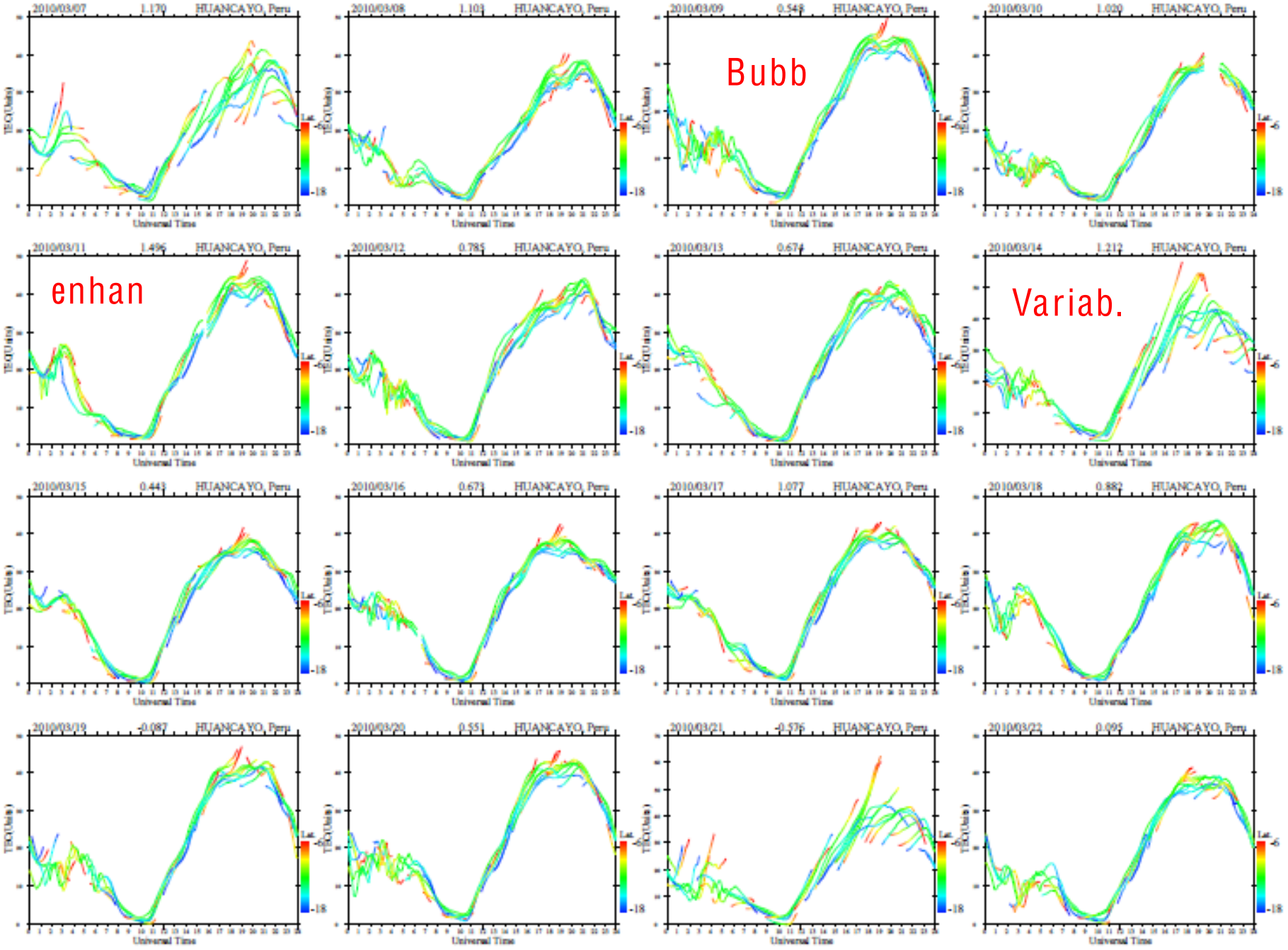
Cesar E. Valladares

24-hr TEC values for Huancayo (mag. Lat ≈ 0)

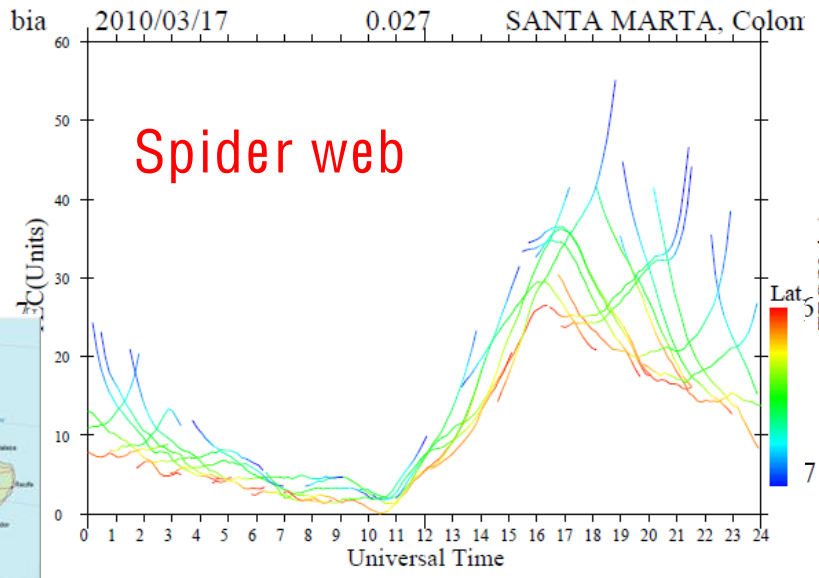


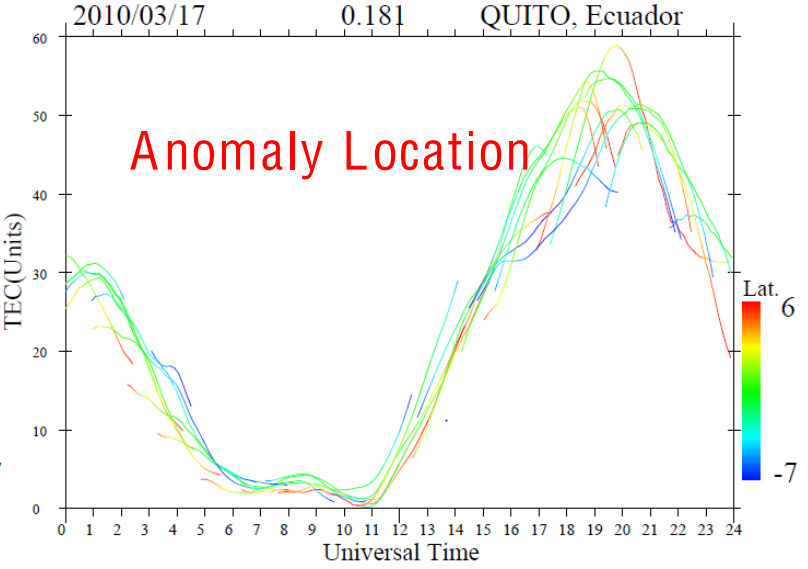
Color-coded according to Latitude

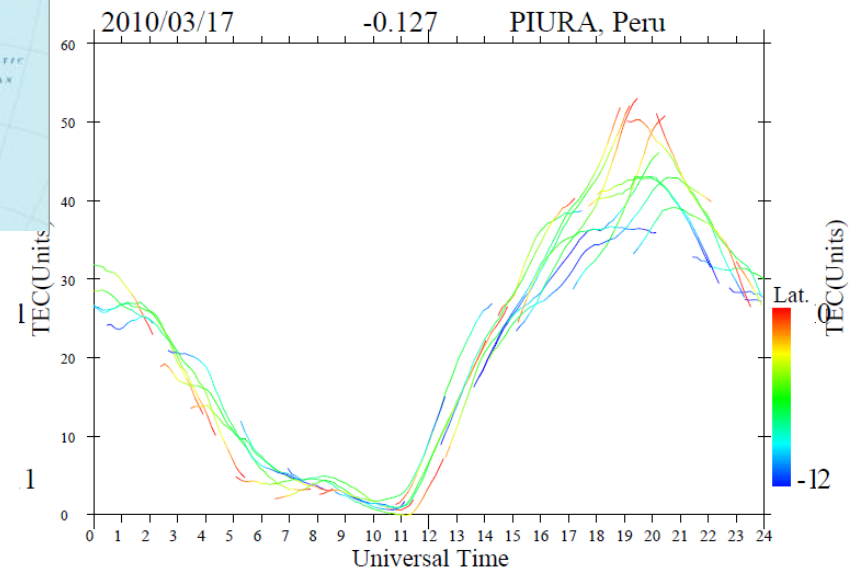
24-hr TEC values for 16 consecutive days from Huancayo

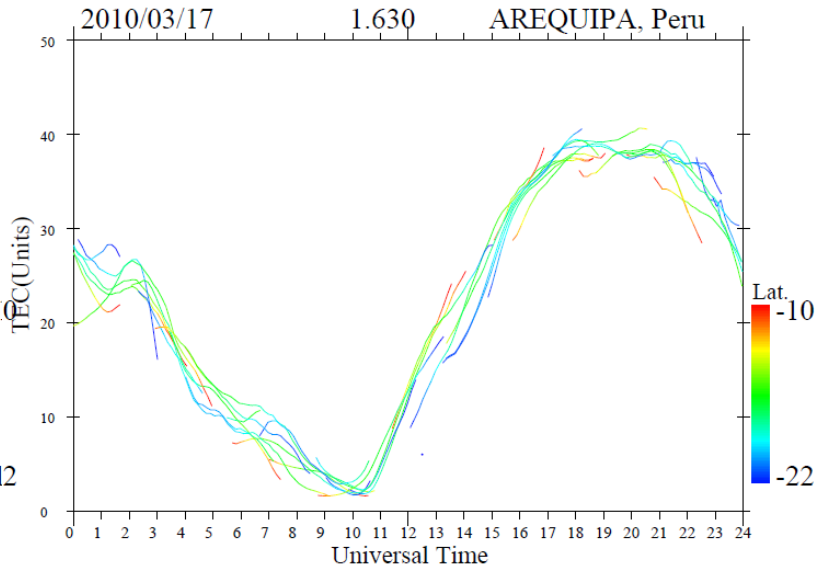


Latitudinal Variability of TEC due to anomaly









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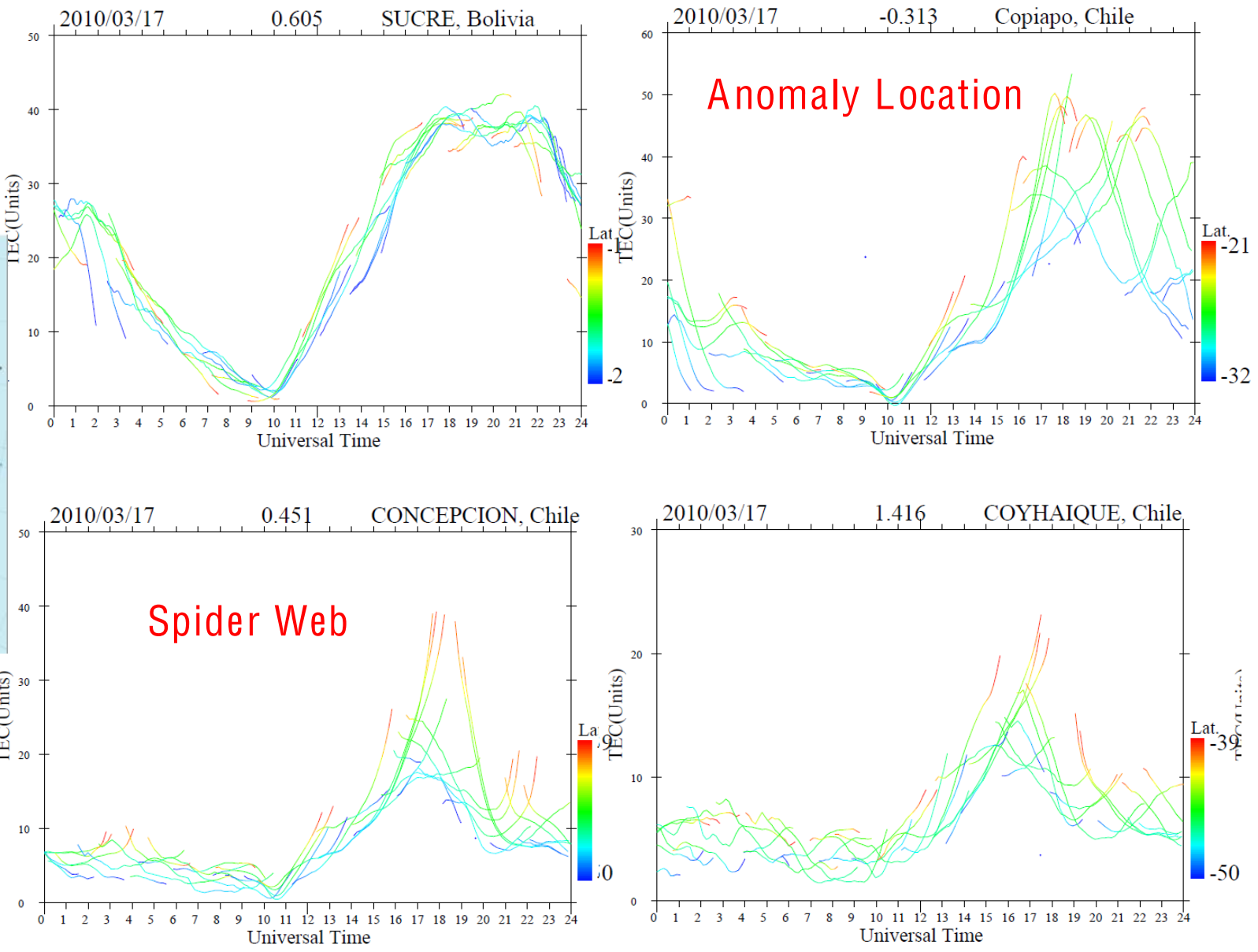
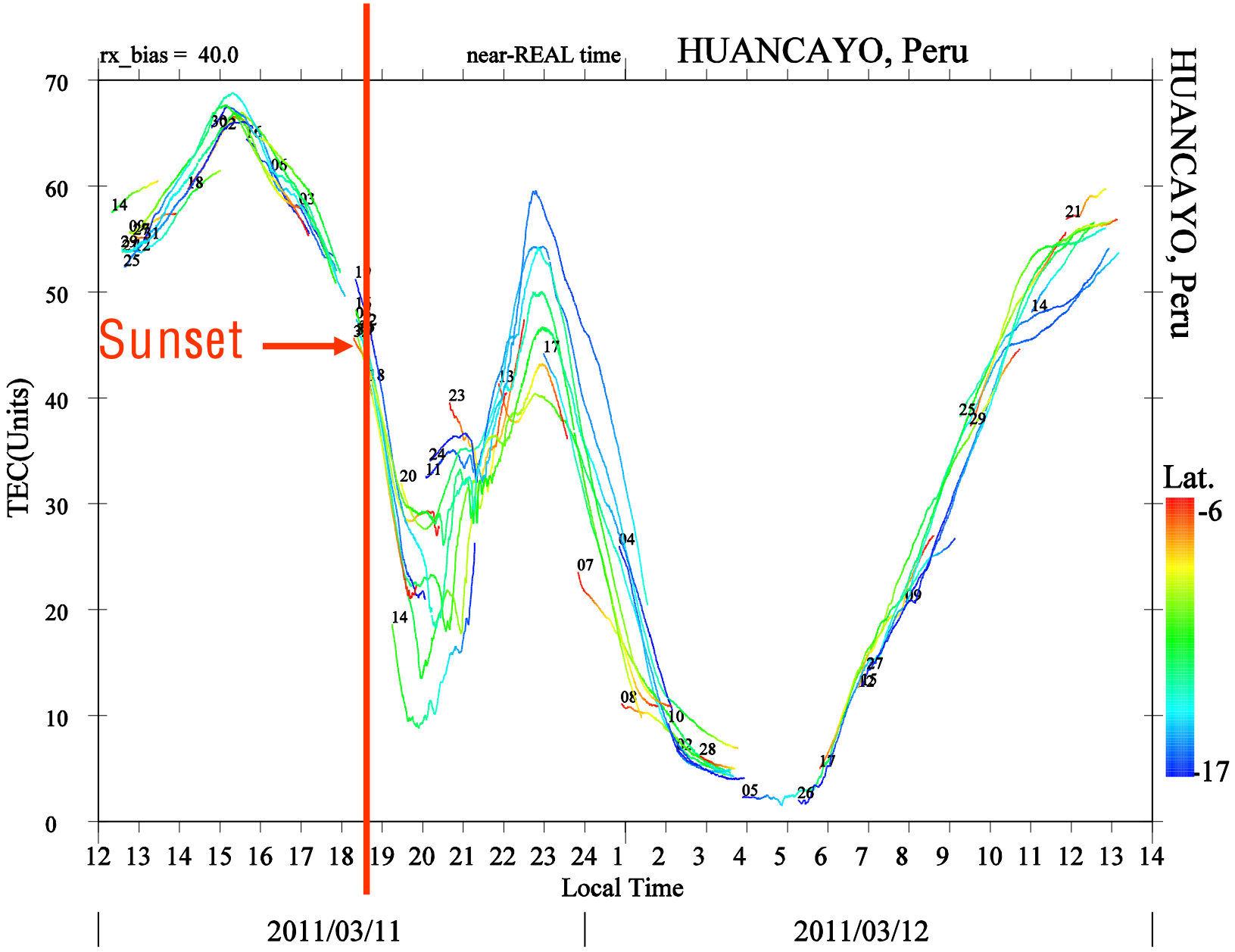
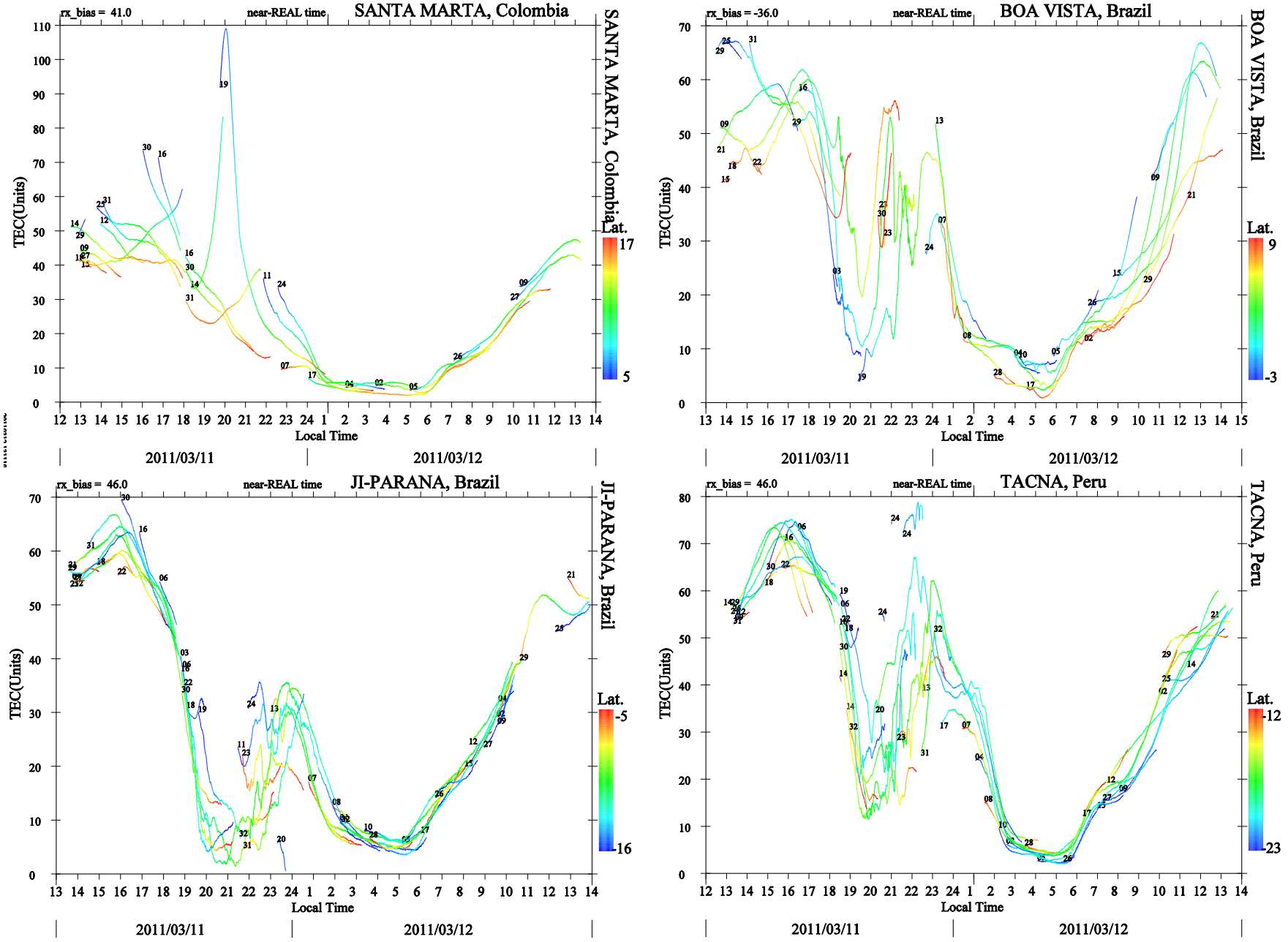


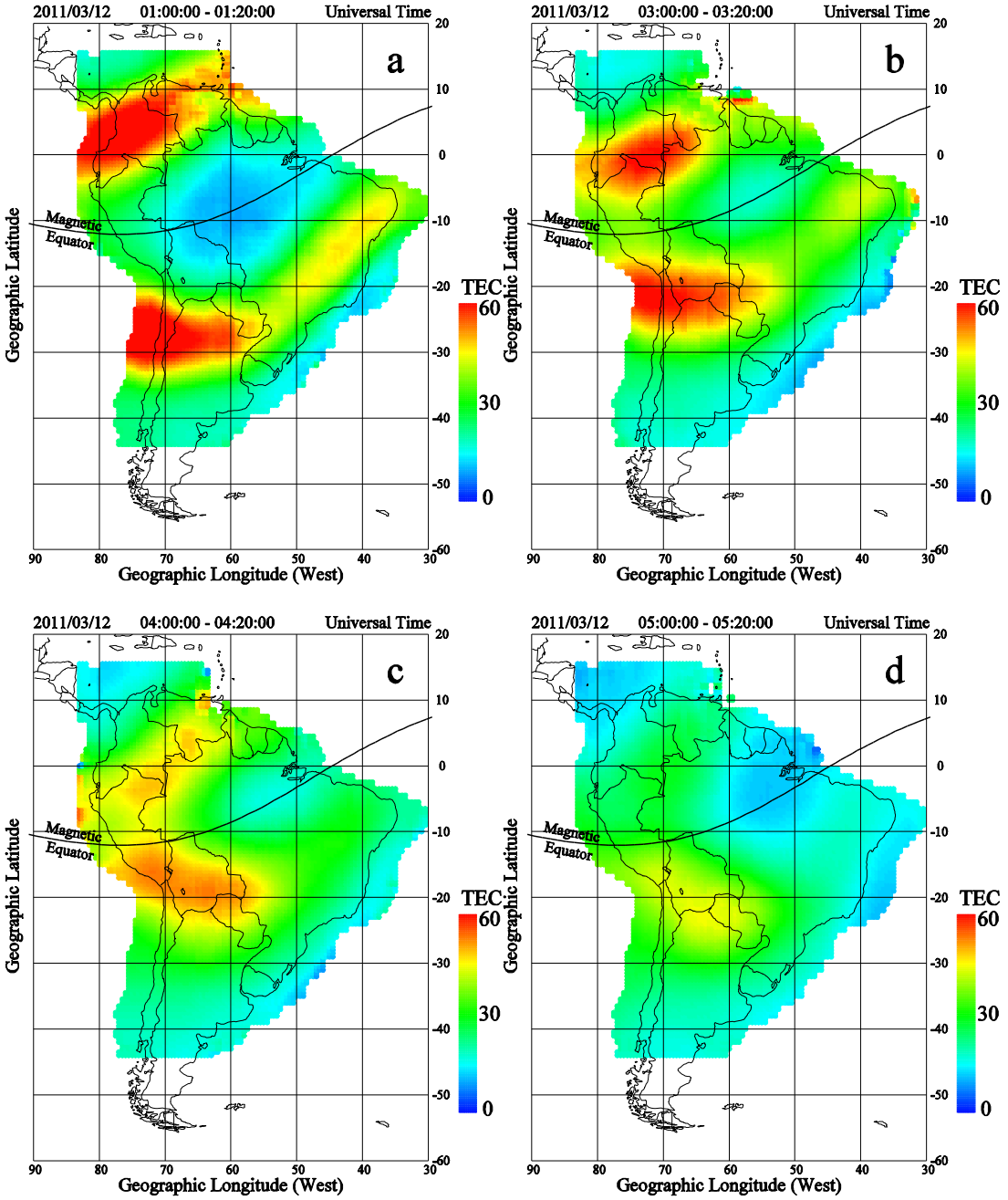
Largest Midnight TEC enhancement



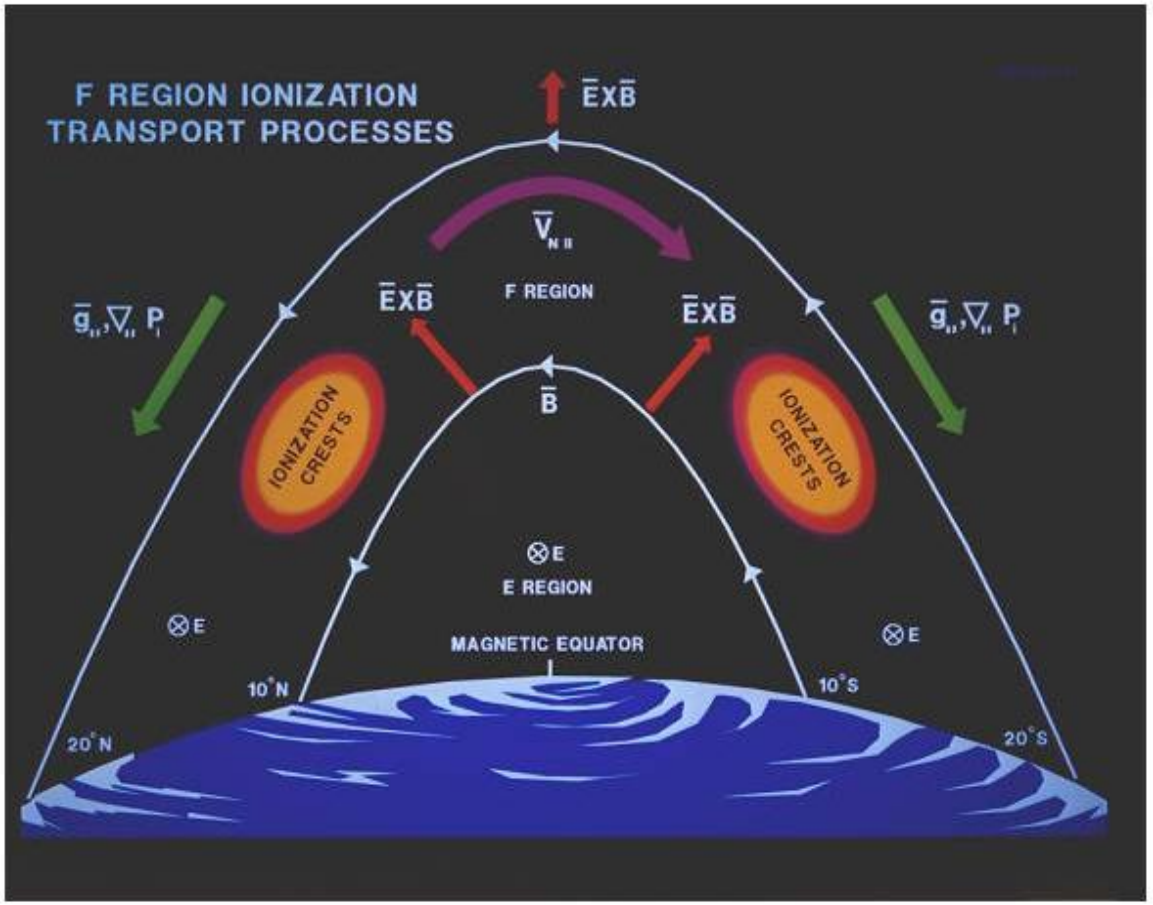
Largest Midnight TEC enhancement



TEC variability over South America measured at 01, 03, 04, and 05 UT



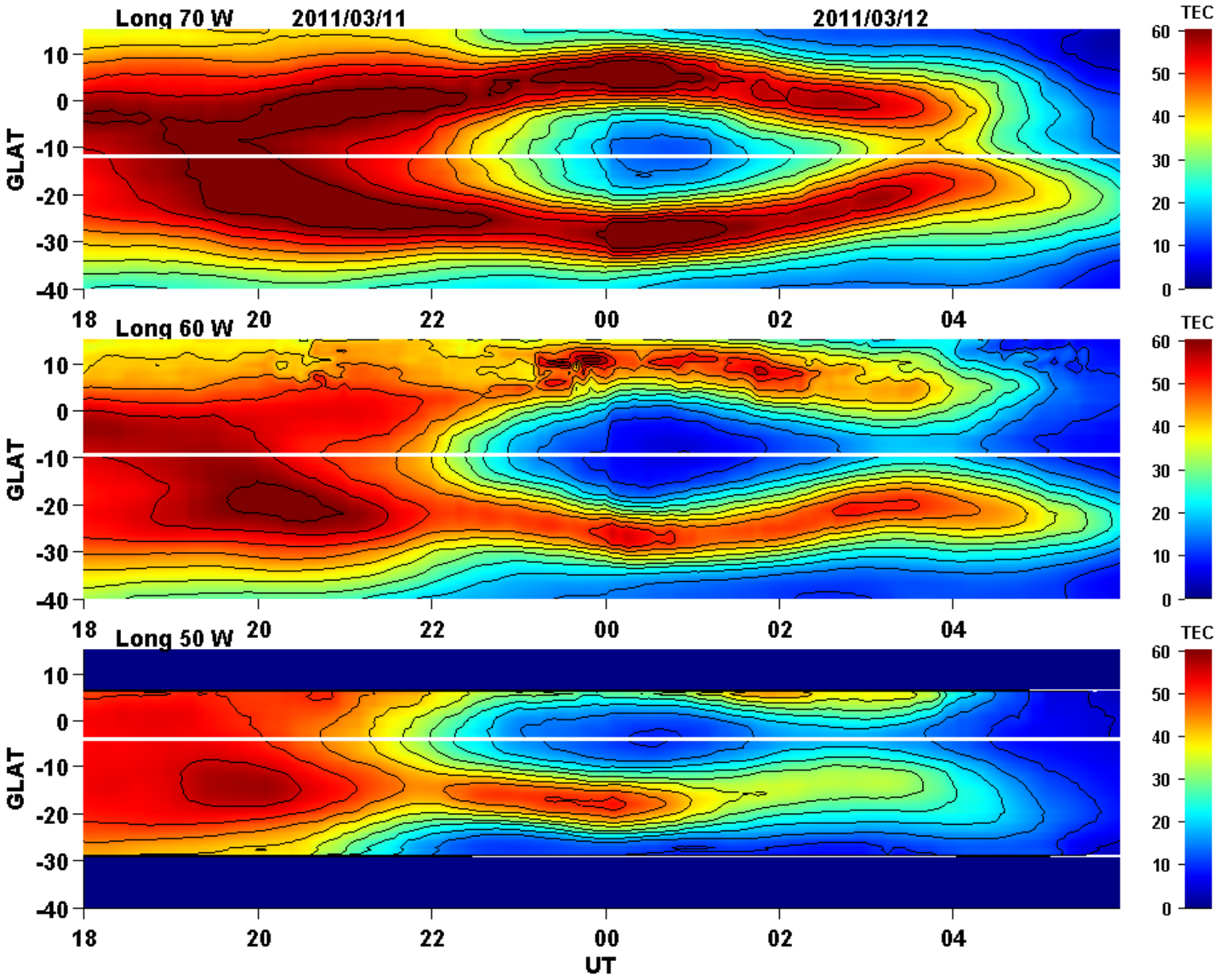
The combination of upward, daytime ExB drift velocity perpendicular to B and downward diffusion parallel to B by gravity and pressure gradient forces create crests in ionization at +/- 15 to 20 degrees magnetic latitude known as the equatorial anomaly. If the daytime, ExB drift velocities are significantly lower or are absent, then the crests in ionization are significantly closer to the magnetic equator or are absent



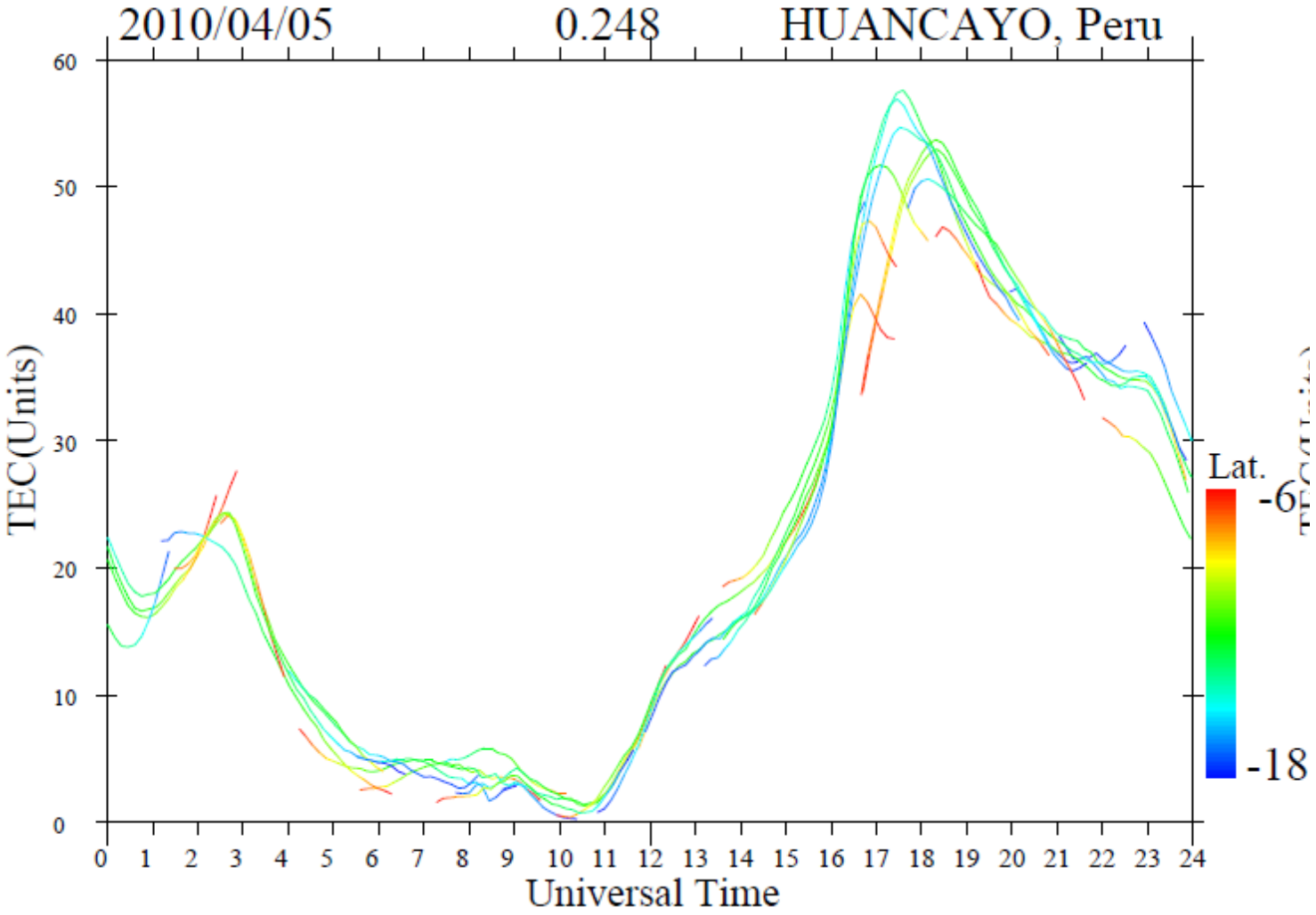
Low Latitude Transport Mechanisms

Provided by D. Anderson

TEC variability over South America measured at 3 fixed Longitudes



Daytime double peak (Kp = 7+)



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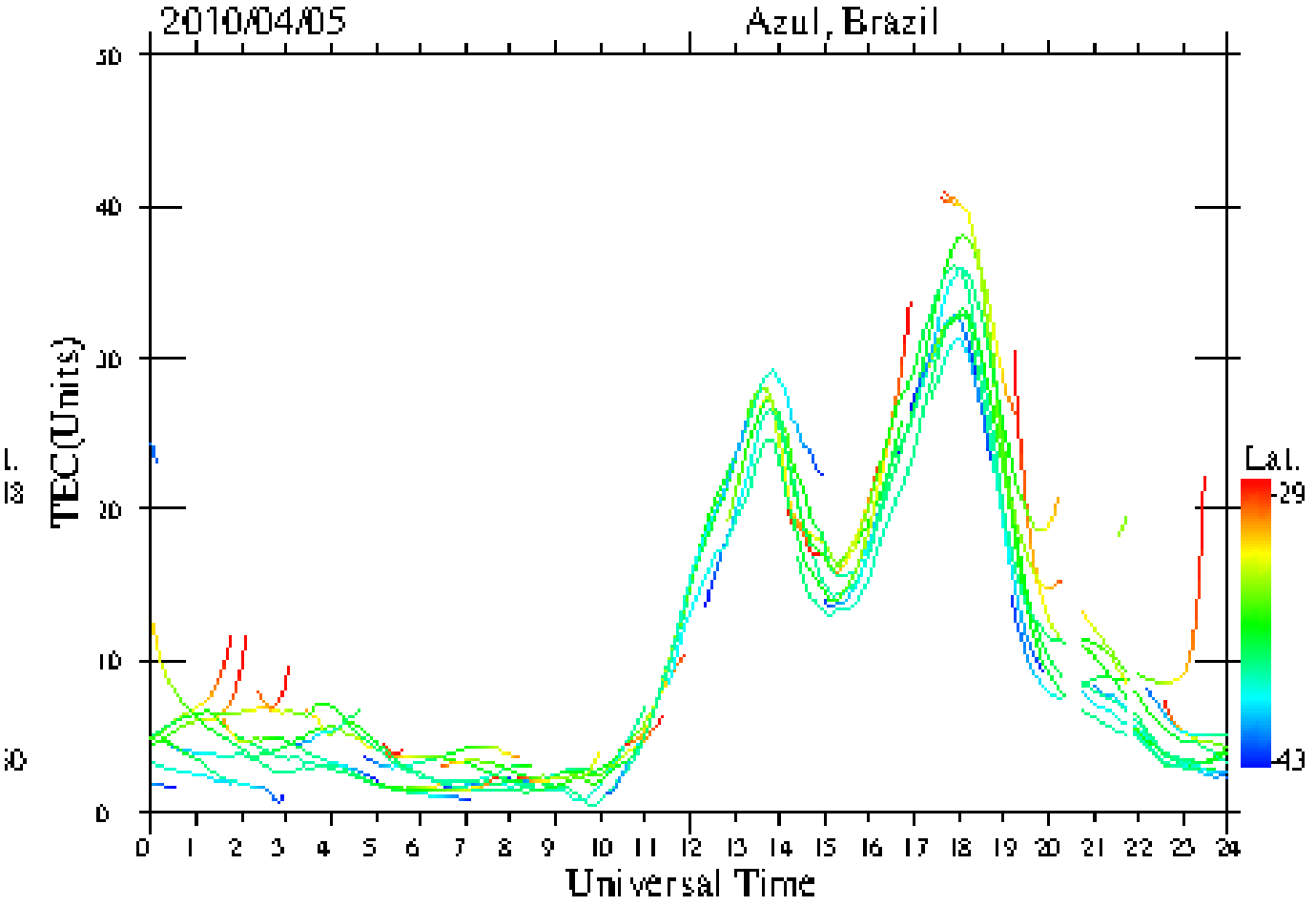
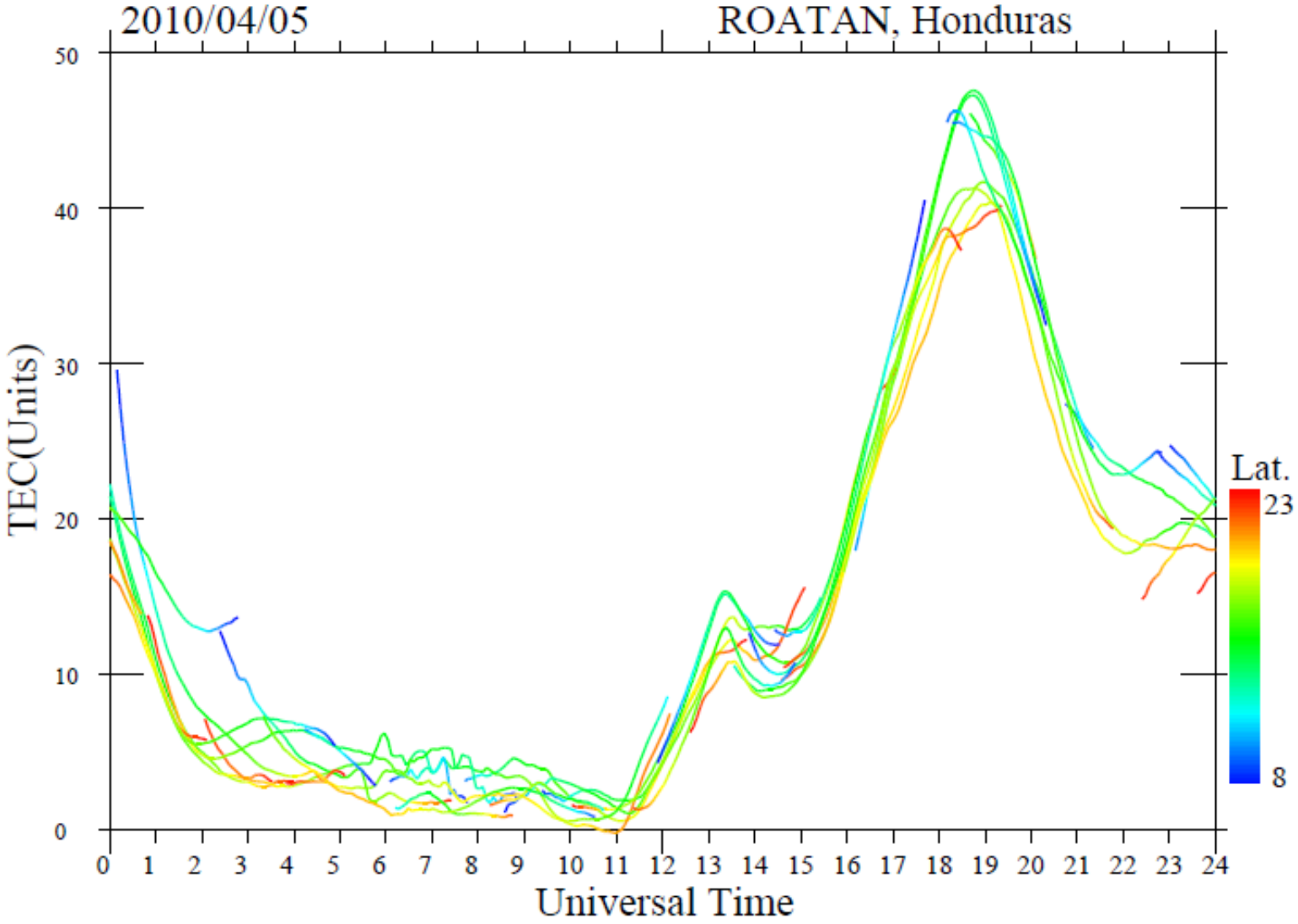
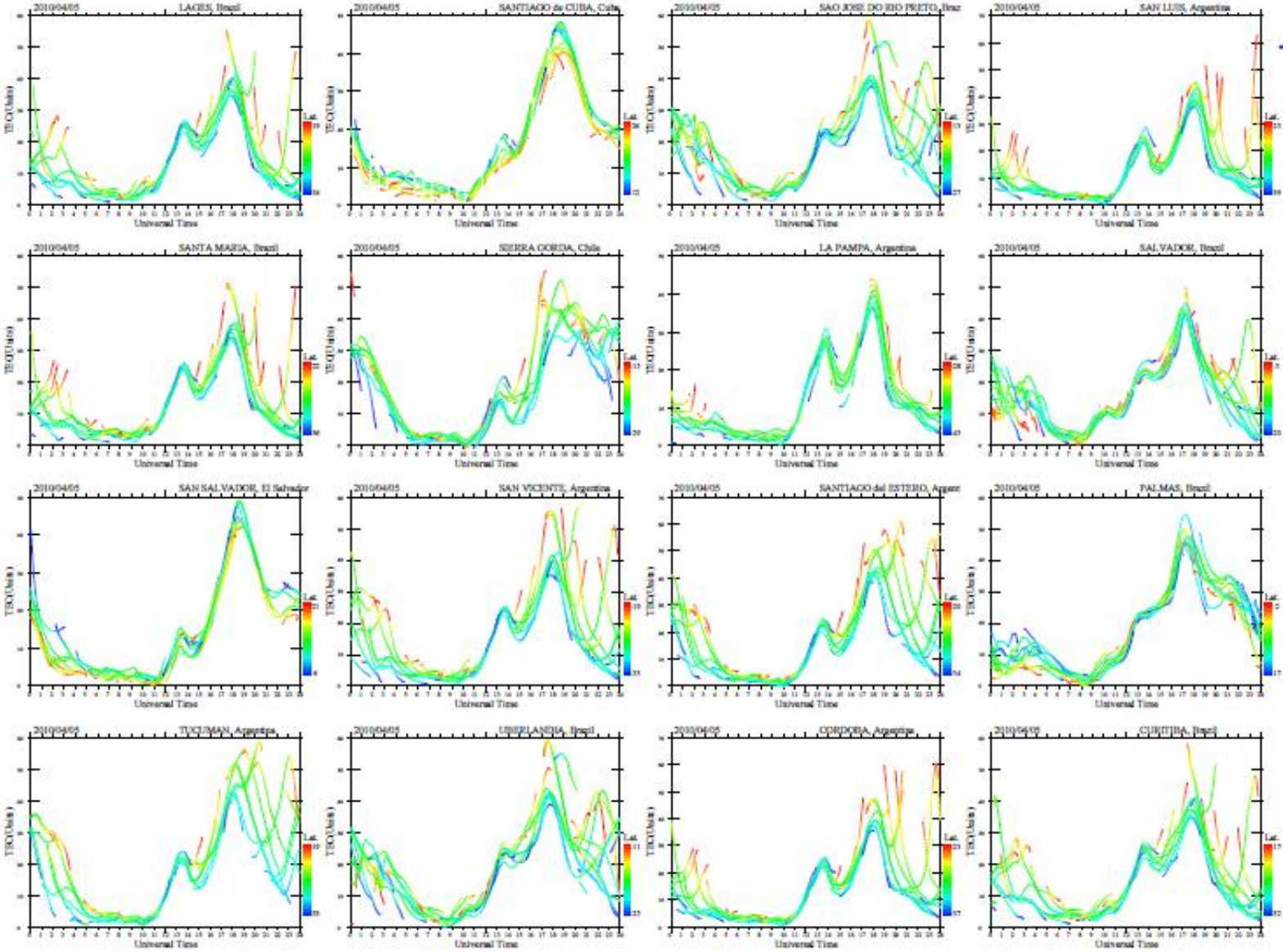


Daytime double peak (Kp = 7+)



Daytime double peak seen on many stations



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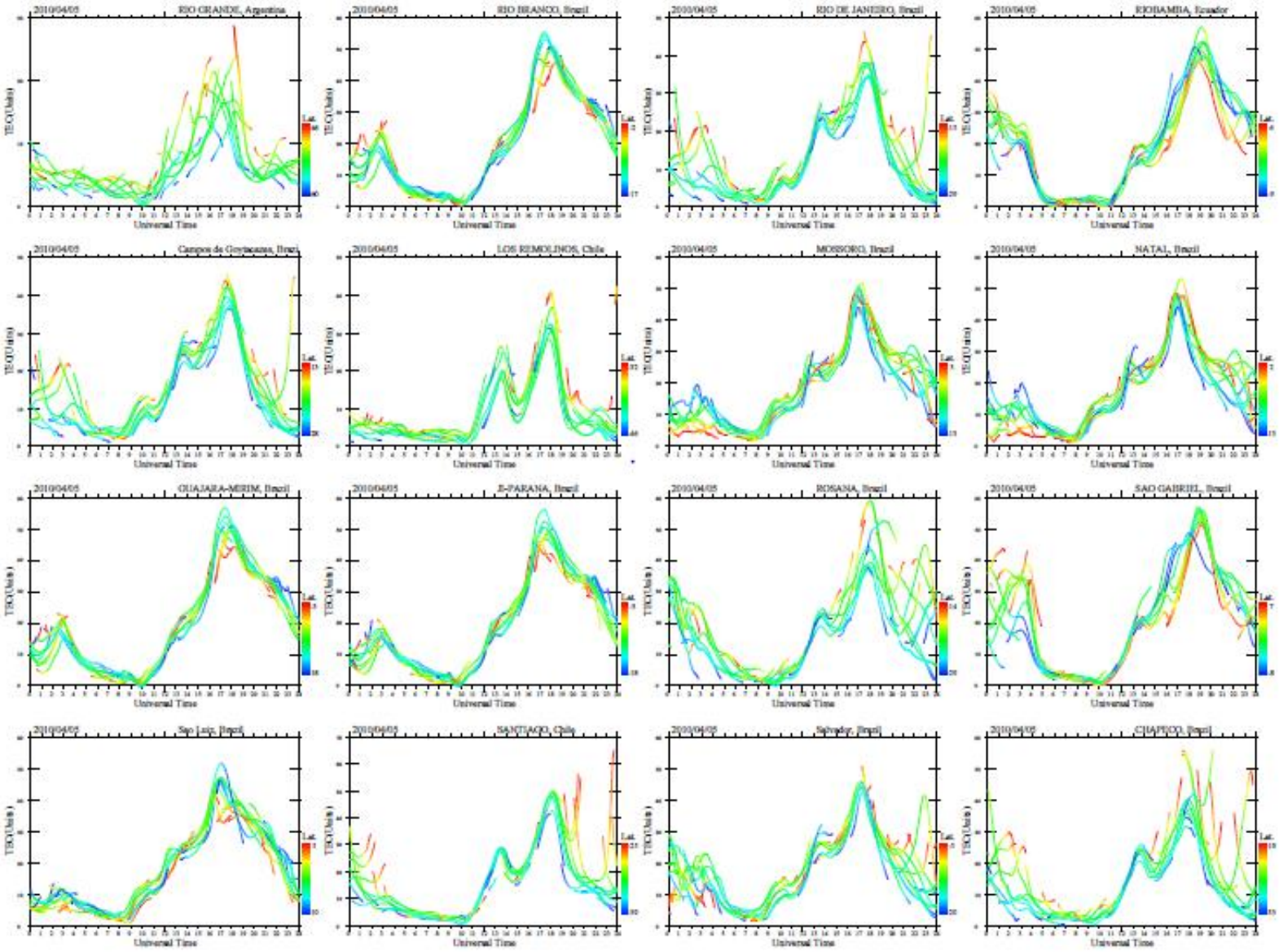
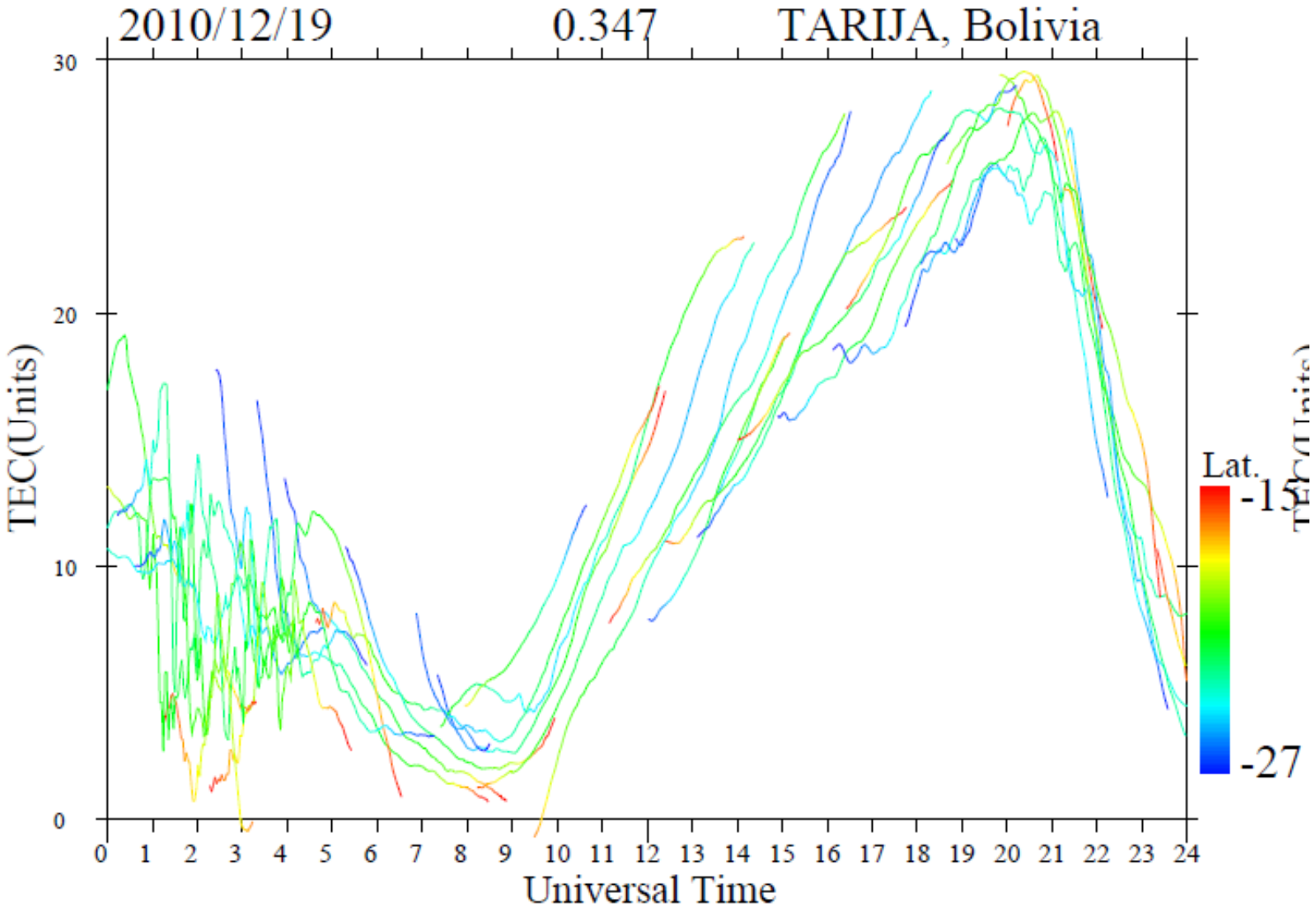
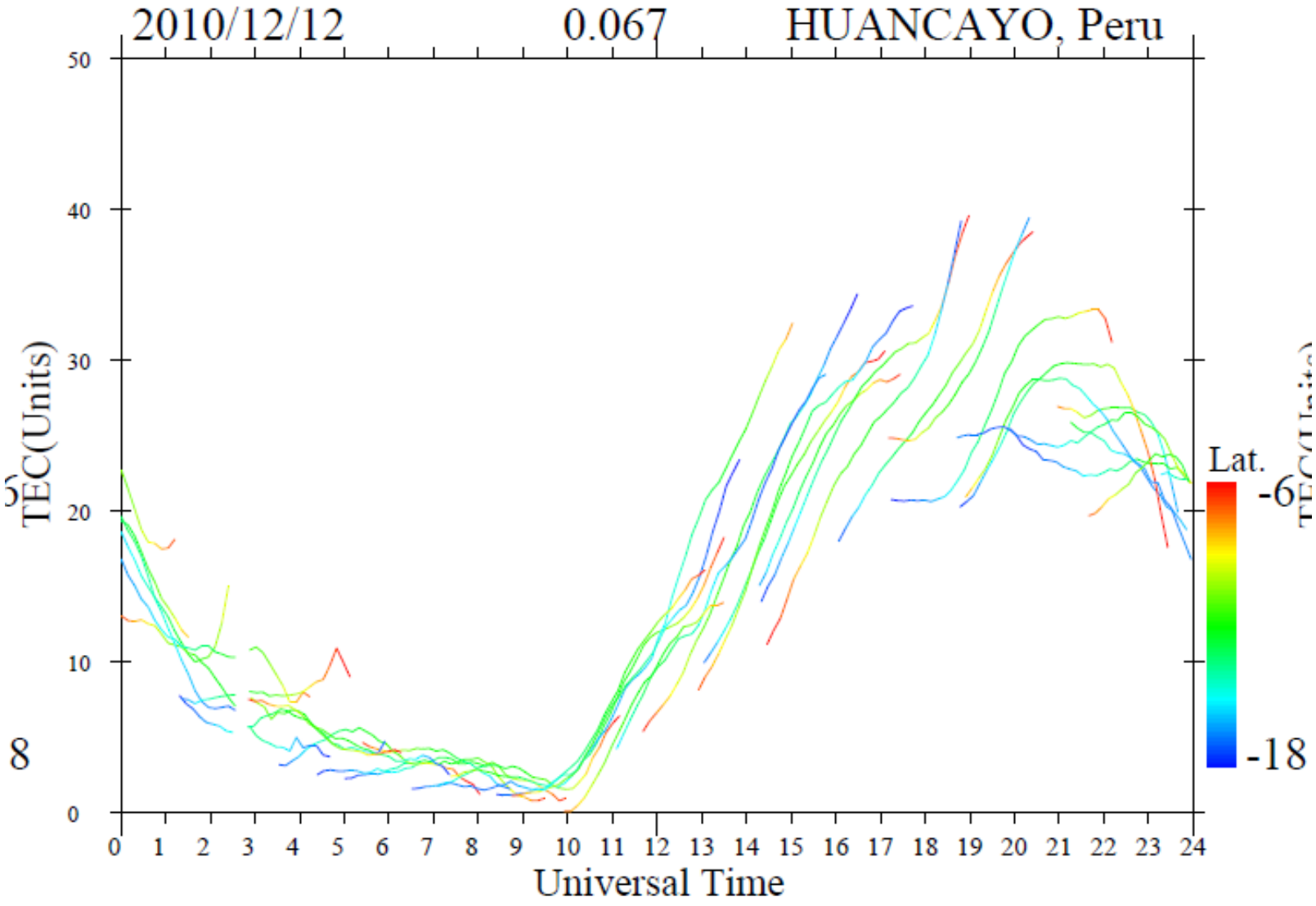


Parallel Traces

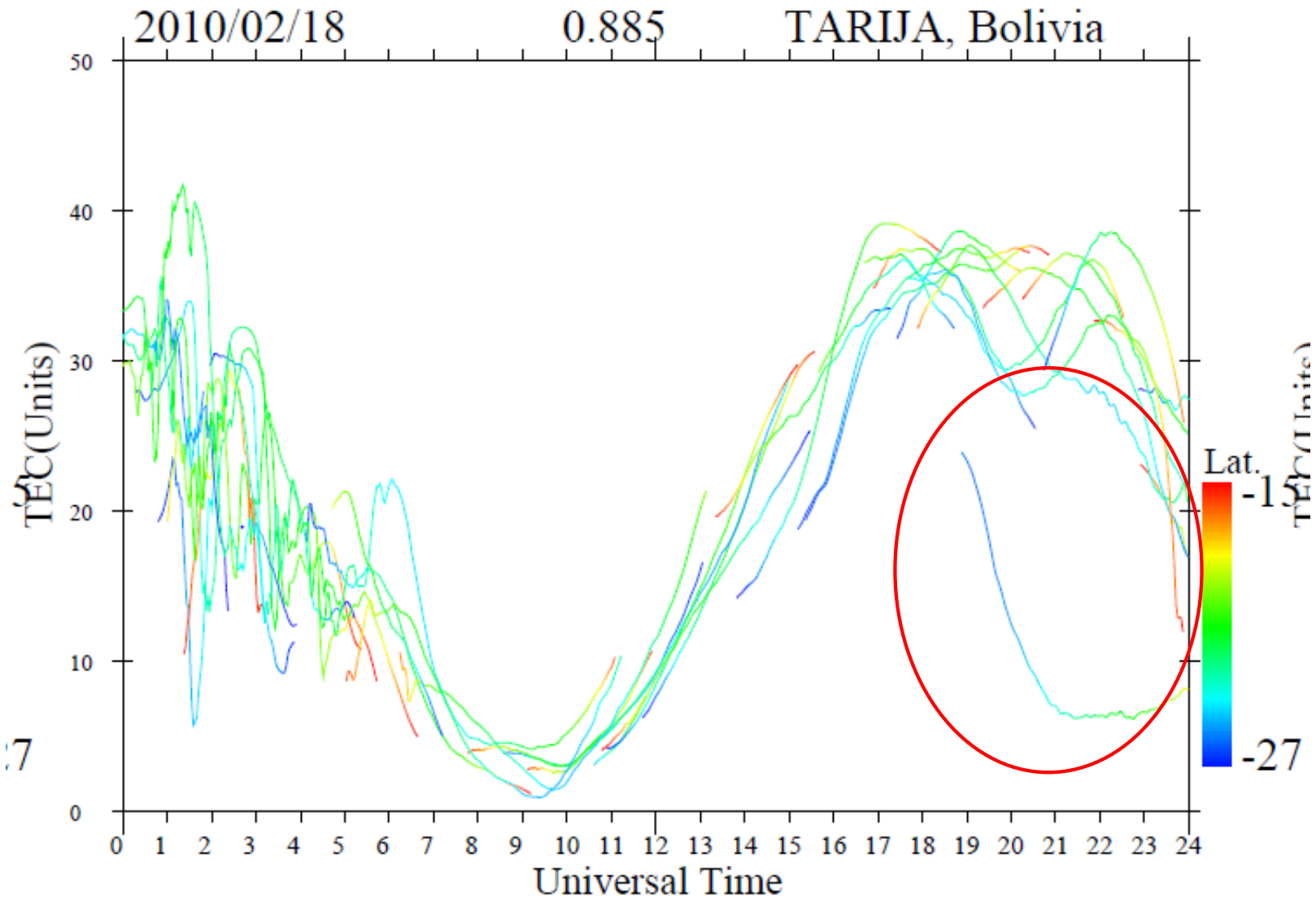


Parallel Traces

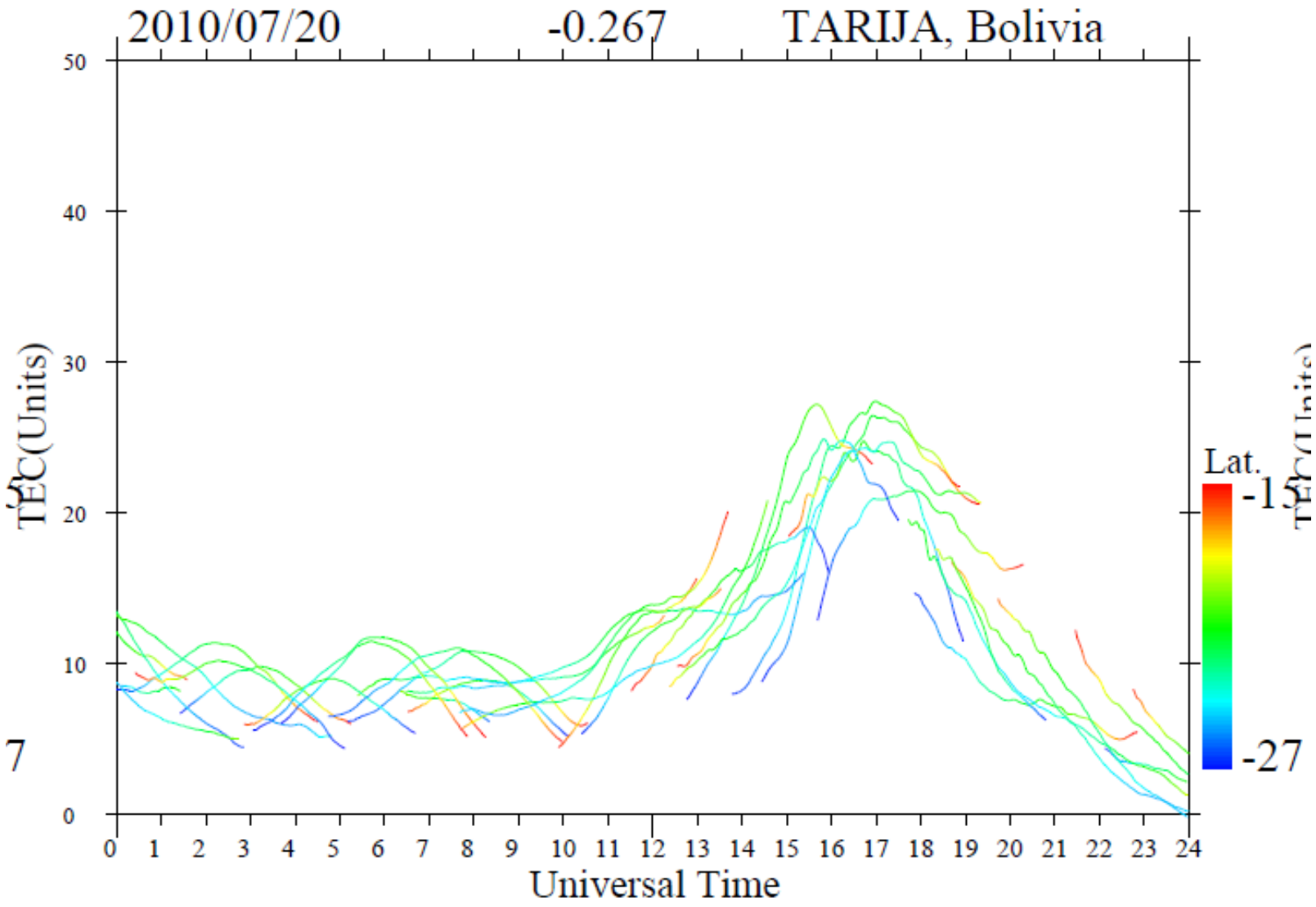


Errors in the calculation of TEC values

Wrong TEC corresponding to one PRN



Probably a Wrong receiver bias

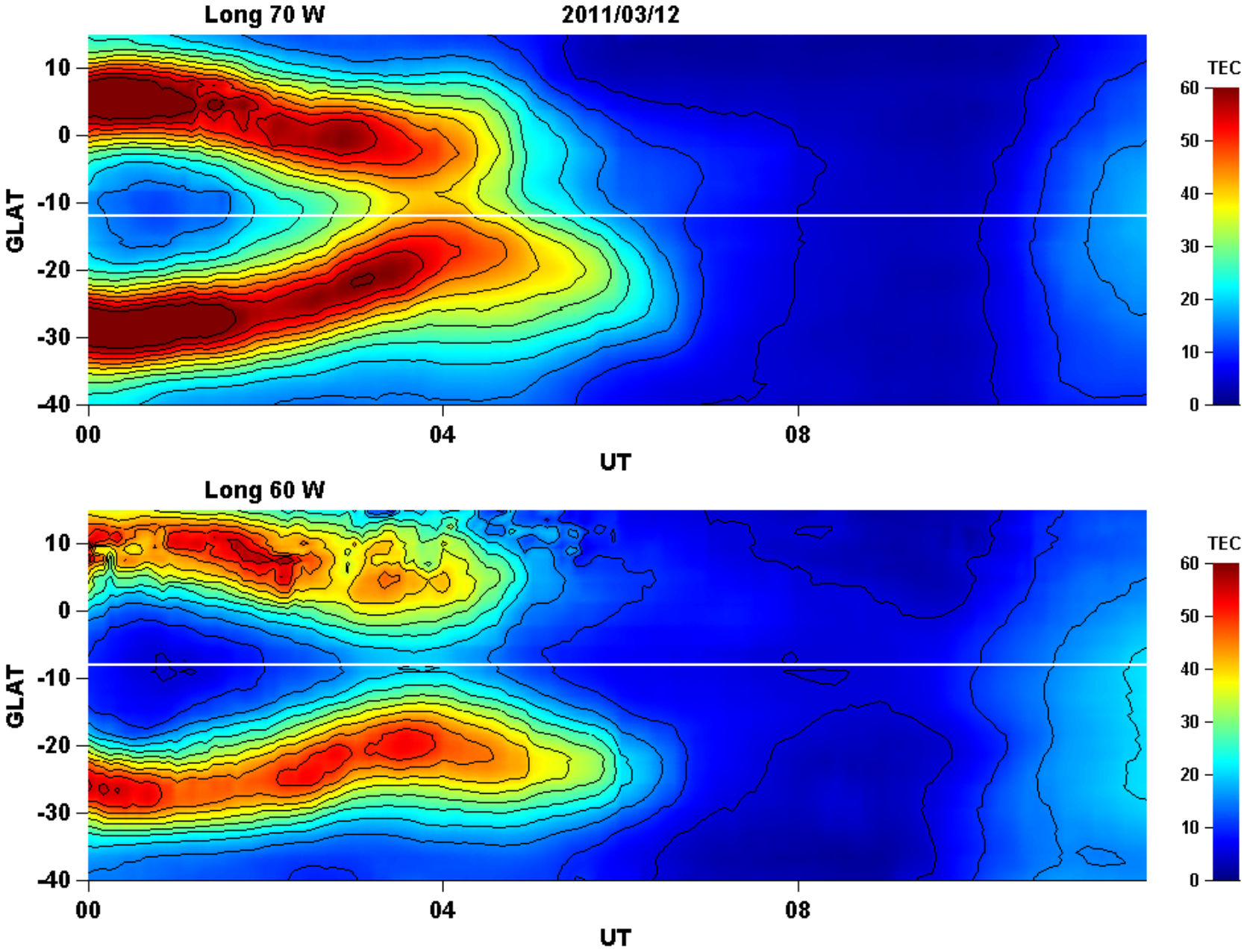



Happy Processing
SECOND LOW-LATITUDE IONOSPHERIC SENSOR NETWORK WORKSHOP
São José dos Campos,SP Brazil - November 7-10, 2011
FAPESP
NASA
SCOSTEP
BRASIL
Sao Jose dos Campos, Nov 2011

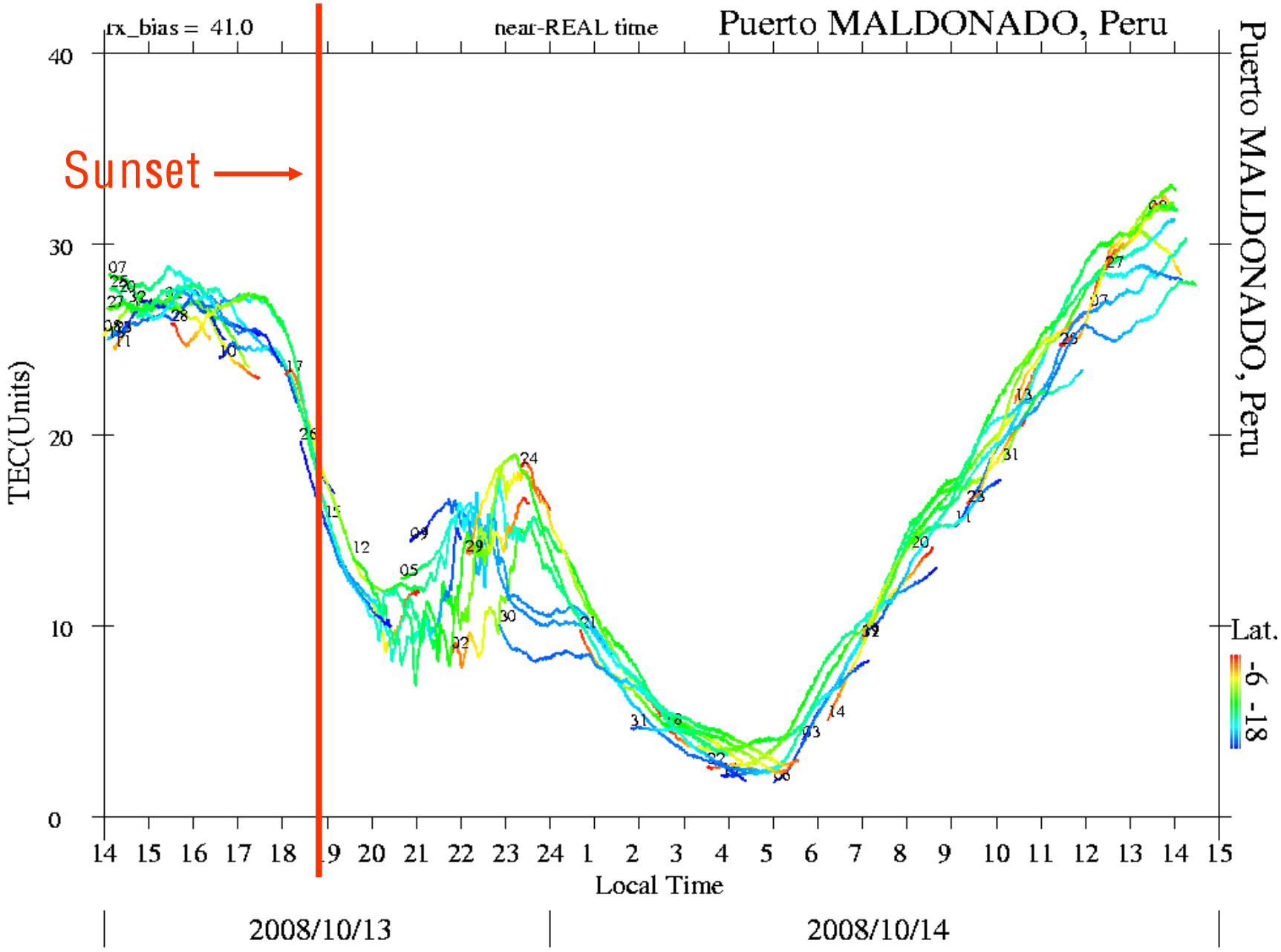
Locations of GPS receivers in South America

Locations of GPS receivers in South America

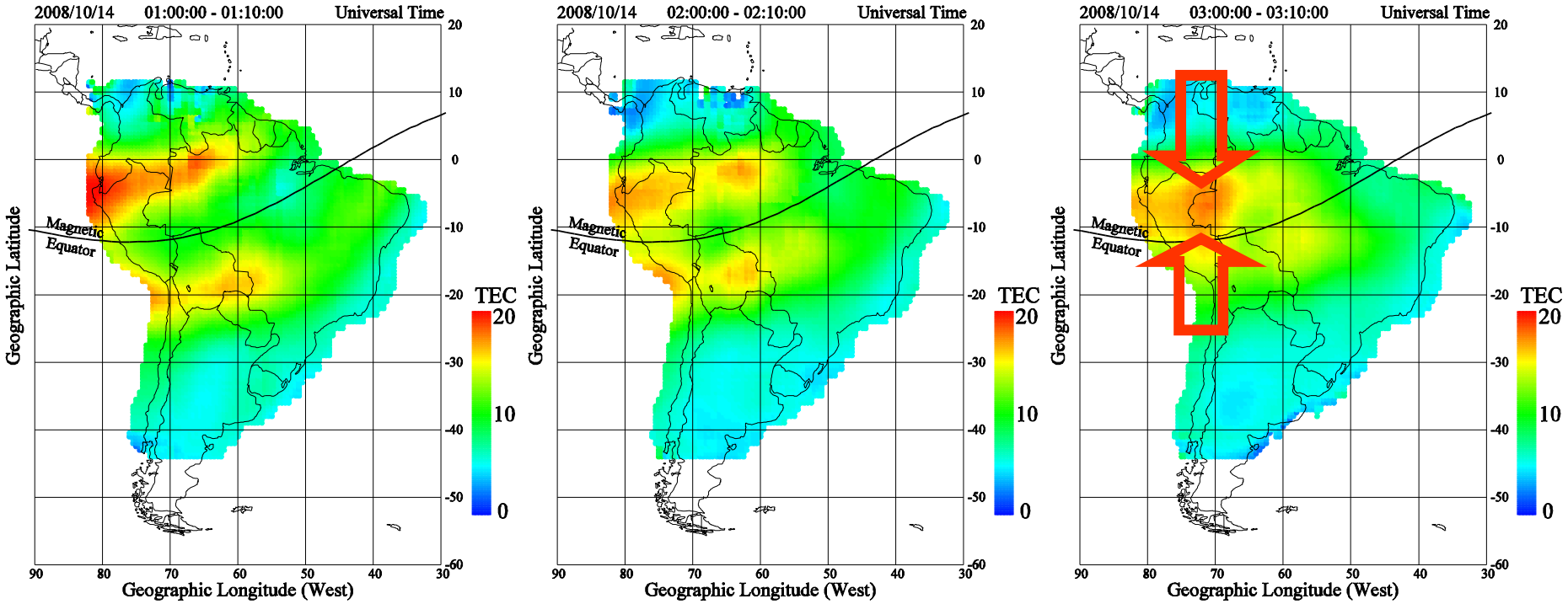
TEC evolution at 70 W and 60 W



After sunset TEC increase near mag. equator October 14, 2008



Reverse fountain effect due to convergent Meridional Winds



Parallel Traces