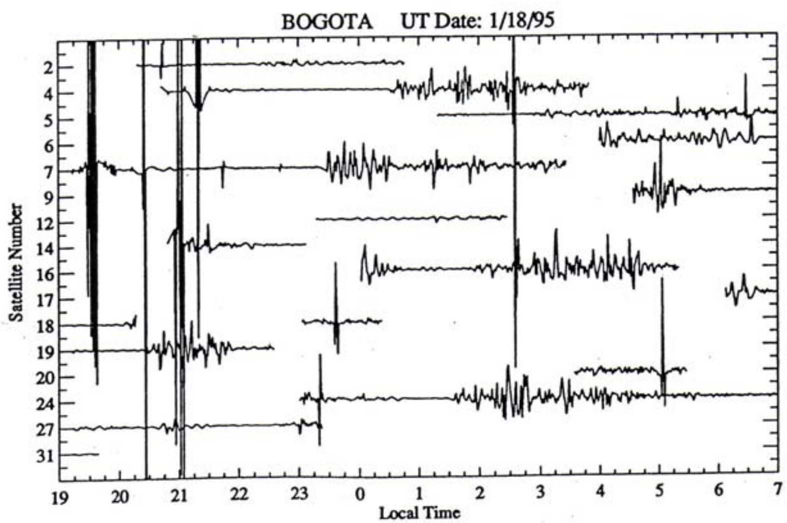
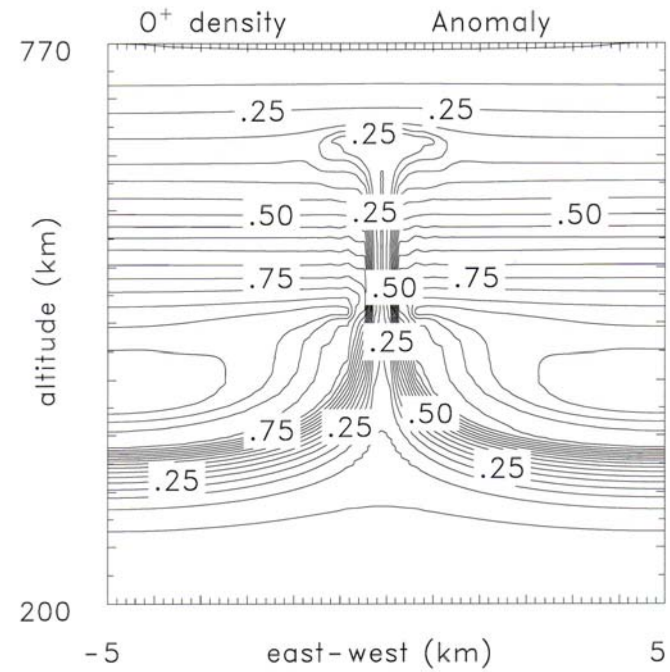
LWS TR&T


BOGOTA UT Date: 1/18/95
Satellite Number
2
4
5
6
7
9
12
14
16
17
18
19
20
24
27
31
19
20
21
22
23
0
1
2
3
4
5
6
7
Local Time


O+ density
Anomaly
770
200
altitude (km)
.25
.50
.75
-5
east-west (km)
5

LWS TR&T

- Ionospheric scintillations can have major impact on human technology, e.g., the Global Positioning System (GPS), which is widely used for navigation, plate tectonics, aircraft landing and takeoffs, and many other applications
- The strongest ionospheric scintillations on earth occur in and near the equatorial anomaly region approximately 10-15^o off the geomagnetic equator
- A major unsolved science problem is the source of GPS scintillations in the equatorial anomaly region. Fig. 1 (left) gives an example of GPS scintillations in Bogota, Columbia in the anomaly region off the equator.
- Recently we have extended our equatorial ionospheric Rayleigh-Taylor bubble model to three-dimensions (Keskinen et al., *Geophys. Res. Lett., 30(16),* 1855, 2003)
- Our model clearly shows (Fig. 1, right) that Rayleigh-Taylor bubbles can be generated at the geomagnetic equator and map from the equator (0^o dip lat) to the equatorial anomaly region at higher latitudes thus providing ionospheric density structures causing GPS scintillations in the equatorial anomaly.