## Identification of possible correlation of diverse multistation GPS scintillations with equatorial ionospheric dynamics

Krishnendu Sekhar Paul<sup>(1),</sup> Ashik Paul<sup>(2)</sup>

- S. K. Mitra Center For Research in Space Environment, University of Calcutta, 92, Acharyya Prafulla Chandra Road, Kolkata- 700009.
- (2) Institute of Radio Physics and Electronics, University of Calcutta, 92, Acharyya Prafulla Chandra Road, Kolkata- 700009.

The dynamic nature of the equatorial ionosphere is not only limited to large spatial extent but exhibits variabilities in transionosphric signal perturbations even across short base lines with ground separation of 250-500 km and subionospheric spacing of 4°-5°. The phenomena of post sunset ionospheric scintillations introduces random, fast and intense fluctuations of the carrier amplitude and cycle slips on the phase of transionospheric satellite links which intersect the plasma bubbles typically drifting from west to east. It is commonly understood that the structures of the ionospheric irregularities change with the progress of time from early evening to late night hours. But rapid evolutions of these structures are also noted spatially in the form of different nature of carrier to noise ratio (CNO) fluctuations at two close subionospheric points indicating dynamic evolution of the structures across short spatial extent. Two dual frequency GPS receivers were operated at Institute of Radio Physics and Electronics(IRPE),(22.58°N,88.38°Egeographic;32°Nmagnetic dip) University of Calcutta, Calcutta, India, and Department of Physics, (26.72°N,88.39°Egeographic;39.49°Nmagnetic dip), North Bengal University (NBU), Siliguri, India, during September, 2012 and April 2013. Differences in detrended CNO fluctuations observed from both the stations on the same GPS link were analyzed. During periods of common scintillation observations at the two stations, correlation was performed on samples of CNO fluctuations of 3 minute interval simultaneously observed from IRPE and NBU on the same SV link for September 2012 and April 2013. During April 2013, 83 cases were noted when the correlation of detrended CNO fluctuations from IRPE and NBU on the same SV link showed negative correlation while 79 cases exhibited positive correlation. A finite time lag was also indicated between the CNO fluctuations observed from IRPE and NBU from which an estimate of the spatial displacement rate of the irregularity

structures was found to be around 5km/sec. Some cases of reverse movement of the irregularities from Siliguri which is at higher latitude towards Calcutta were also noted.