

## Observations of plasma bubble drift velocities by GPS receivers at two closely separated locations, Hanoi and Hainan

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Equatorial Spread-F (ESF) is observed in the equatorial and low-latitude ionosphere after sunset till midnight. Scintillation of radio waves in the wide frequency ranges is caused by ESF and results in serious problems in satellite navigation and communications. When plasmabubbles are generate, they drift eastward at several 10s to 200 m/s with growing upward and poleward. Precise measurements of plasma bubble drift velocities are very important in forecasting their movement.

Scintillation measurements by spaced GPS receives on the ground have been often used to measure the plasma bubble drift velocity. However, it is the drift velocities of a few 100s m scale irregularities in the plasma bubbles that can be measured by this technique. And they are not always the same as the drift velocity of the plasma depletion regions measured by other instruments, such as satellites.

To study precisely the relationship between the drift velocity of large scale structures of plasma bubbles and that of small scale irregularities, and to investigate how the irregularity drift velocity changes with the plasma bubble movement, we have installed two sets of drift velocity measurement system at Phu Thuy (Vietnam, 21.0N, 106.0E) and Hainan (China, 19.5N, 109.1E).

At the meeting, the research plan and the preliminary results of observed data sets will be presented.