not a narrow Gaussian as originally thought. Moreover, the spectrum of these echoes was very wide, resembling the expected incoherent spectrum at these altitudes. In this work we present the results of concurrent dual beam observations along the magnetic meridian (perpendicular to **B**, ~2° and ~5° off). On reception, a North-South interferometer was used for each beam, allowing for the first time, the measurement of the angle of arrival (AOA) of the 150-km signals. Our preliminary results show that the AOAs vary both in time and altitude, suggesting a meridional modulation. Moreover, the spectrum shape of the off-perpendicular to **B** echoes show a well defined structure that changes with time and varies with altitude. A possible scenario for the observed angles is presented. Finally, we present and discuss our attempts to characterize the enhanced wide spectra using the well-known incoherent scatter theory in this poorly understood region.

The possible role of Inter-hemispheric-field-Aligned Current for the generation of 150-km echoes

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The 150-km echoes are the quasi-periodic echoes often present in the day-time equatorial ionosphere. They are routinely observed from the equatorial radars such as Jicamarca, Pohnpei and São Luís radars. Here, we present the occurrence statistics of these echoes from the São Luís radar. The radar operates at 30 MHz frequency and detects the 5 meter scale size irregularities. The five years statistics reveal the preferred occurrence of these echoes during July-August, less-preferred occurrence during December-January and least preferred occurrence during April-May/October-November. These seasonal variations are found to be very similar to the seasonal variations of inter-hemispheric-field aligned current (IHFAC) which arises due to the imbalanced sq current system across the equator.

The imbalanced current system cause the large conductivity gradient across the equator and drives the large IHFACs. Moreover, its effect is confined below 200 km in ionosphere and it is maximum at the equator. These properties together with similar seasonal variations put them as one of the possible candidate to cause the 150-km echoes. Our recent three-dimensional model of convective instability reveals the explicit contribution of parallel dynamics into the growth rate. In the absence of perpendicular (to the Earth's magnetic field) gradients and currents in the vicinity of 150 km region, the parallel contribution, thus, becomes vital. The effect of this contribution under imbalanced sq current system is investigated. This may be useful in understanding the generation mechanism of 150-km echoes.

Unexpected rapid decrease in phase velocity of sub-meter Farley-Buneman waves with altitude*

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