

**On the spectral features of equatorial F-region coherent backscatter radar echoes  
observed by MELISSA**

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In this presentation, we will give a brief introduction to an ionospheric radar system MELISSA (Measurements of Equatorial and Low-latitude Ionospheric irregularities over Sao Luis, South America). We will also present initial results of spectral analyses of pre- and post-midnight F-region observations made with this system.

MELISSA is a 30 MHz coherent backscatter radar interferometer deployed in the magnetic equatorial site of Sao Luis, Brazil (2.59° S, 44.21° N, -3.99° dip lat) in March 2014. Analyses of F-region observations made with this system have shown the detection of the bottom-type, bottom-side, and topside equatorial spread F (ESF) events during different seasons. We also detected F-region scattering layers in the post-midnight sector.

We estimated the spectral widths and mean Doppler velocities from the best-fit of a Gaussian model to the observed Doppler spectrum. We found that the bottom-type echoes have narrow spectral widths and mean Doppler velocities that do not vary much with height. The topside echoes, on the hand, have spectral widths and mean Doppler velocities that can vary greatly with height. In order to provide an overview of the spectral features of F-region echoes observed by MELISSA, we created histograms of spectral widths and mean Doppler velocities for bottom-type and topside events. For bottom-type events, the spectral widths and mean velocities are typically within a few 10's m/s. Topside echoes, however, have mean Doppler velocities and widths within several 10's m/s. We will discuss the spectral features of the F-region echoes observed by the Sao Luis radar in terms of our current understanding of spread F and previous observations at Jicamarca and other radar sites.