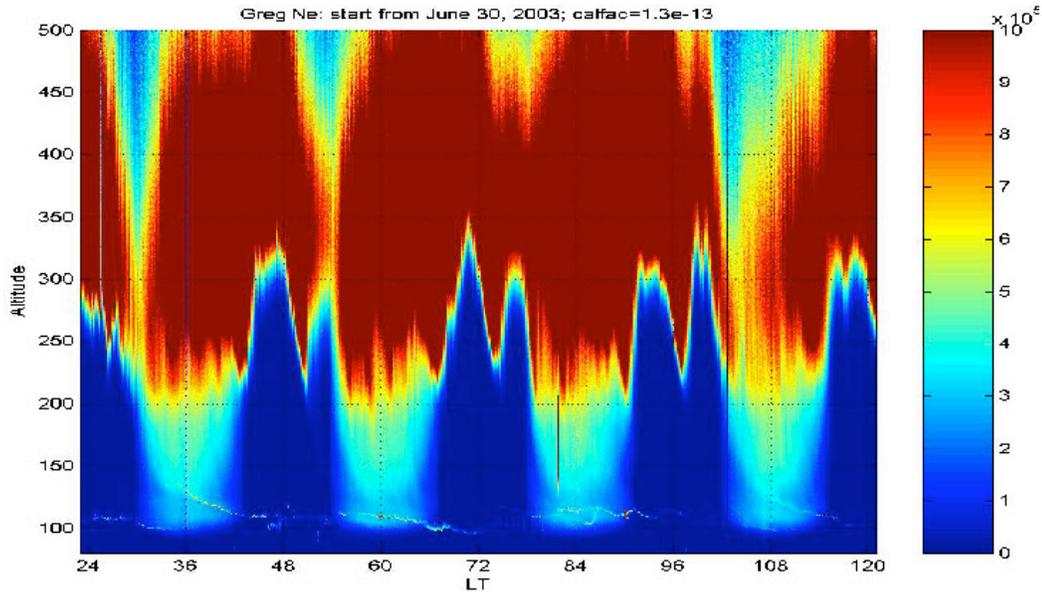


Dual-Beam incoherent scatter radar study of the mesosphere at Arecibo

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Electron density distributions as a function of local observation time and altitude obtained using the incoherent scatter radar in Arecibo, Puerto Rico.

The ionosphere is highly dynamic. Its variability is driven by solar and geomagnetic activities as well as global circulation of the atmosphere through photochemistry, electrodynamics, fluid dynamics, and ion-neutral coupling processes. In this project, we use the Arecibo dual-beam incoherent scatter radar (ISR) to study mesosphere, a region of the ionosphere with relatively low electron concentration. By using a new pulsing scheme, we have shown that the integration time can be reduced by two orders of magnitude in the region. The dual-beam capability, recently available at Arecibo, provides simultaneous observations in two coplanar directions. The much shortened integration time and the dual-beam capability at Arecibo are expected to precipitate a number of ionosphere studies. In particular, observations of dynamics temporal and spatial spectral characteristics, wave propagation, energy transfer, and atmospheric stability are some of the topics under investigation.

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