

Discovery science near the magnetic equator

D. L. Hysell and M. A. Milla

CEDAR 2020 Virtual Workshop

June 25, 2020

- ▷ Please mute yourself.
- ▷ Questions via chat box or raised hands.
- ▷ Speakers, keep to your time.

- ▷ Marco Milla – Jicamarca status (15 min.)
- ▷ Jorge Chau – multistatic meteor winds (10 min.)
- ▷ Gerald Lehmacher – 150 km echoes I (10 min.)
- ▷ William Longley – 150 km echoes II (10 min.)
- ▷ Carlos Martinis – optical studies (10 min.)
- ▷ Cesar Valladares – LISN status (10 min.)
- ▷ David Hysell – ESF forecasting (10 min.)
- ▷ Fabiano Rodrigues – AMISR 14 status (10 min.)
- ▷ Sevag Derghazarian – topside echoes (10 min.)
- ▷ Joe Huba – IVM/SAMI3 modeling (10 min.)
- ▷ Rob Pfaff – NASA Peru campaign (15 min.)

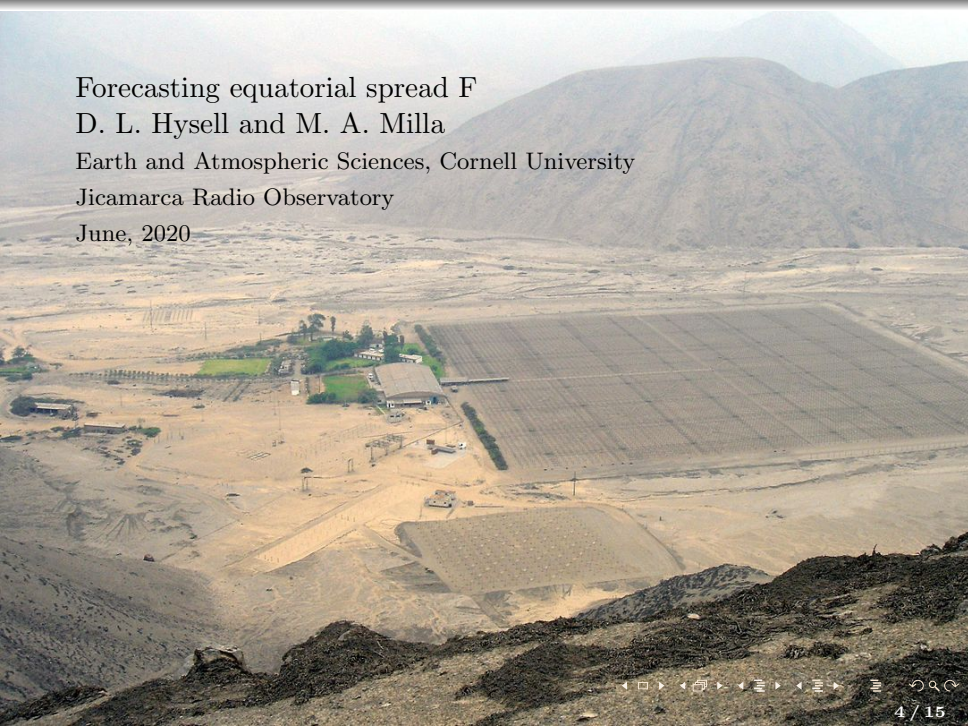
Forecasting equatorial spread F

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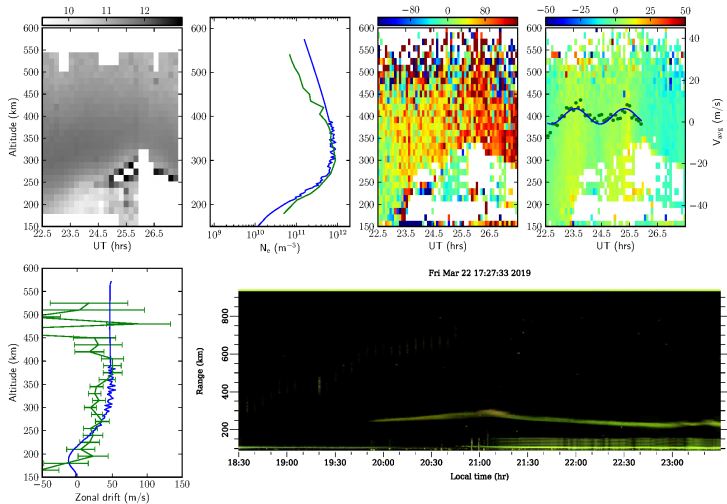
Earth and Atmospheric Sciences, Cornell University

Jicamarca Radio Observatory

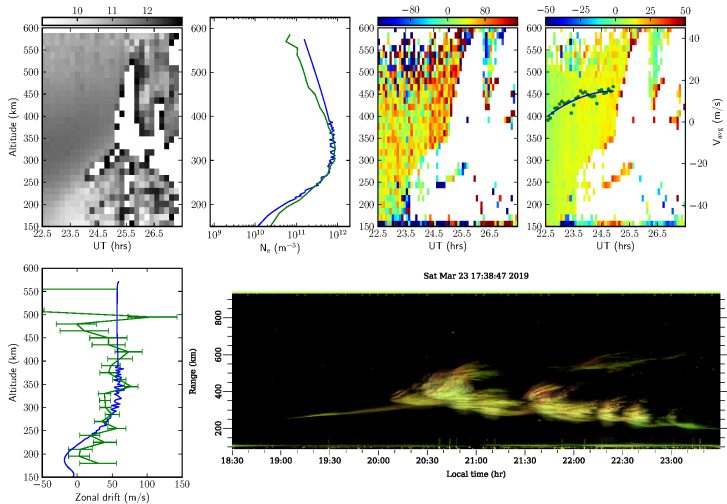
June, 2020



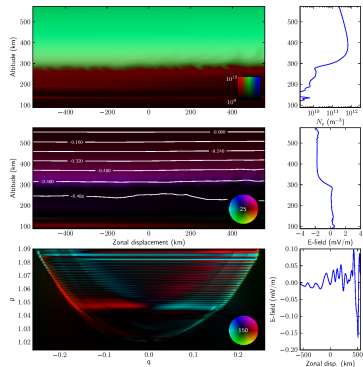
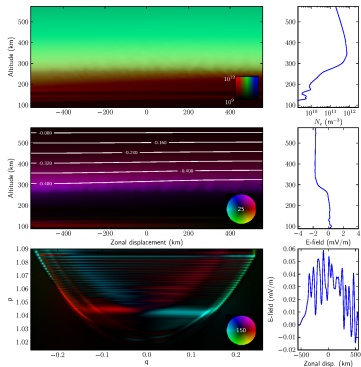
JRO campaign, Mar. 22, 2019



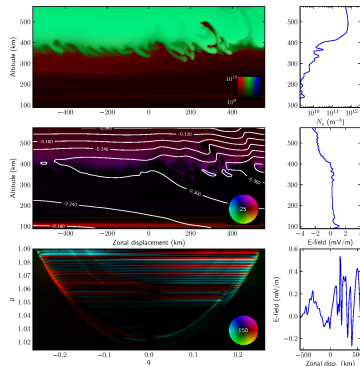
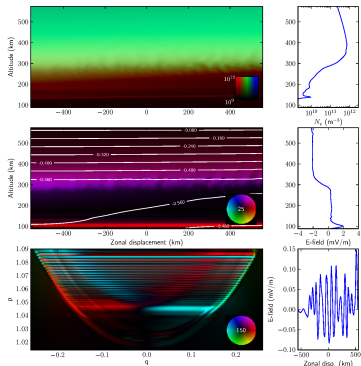
JRO campaign, Mar. 23, 2019



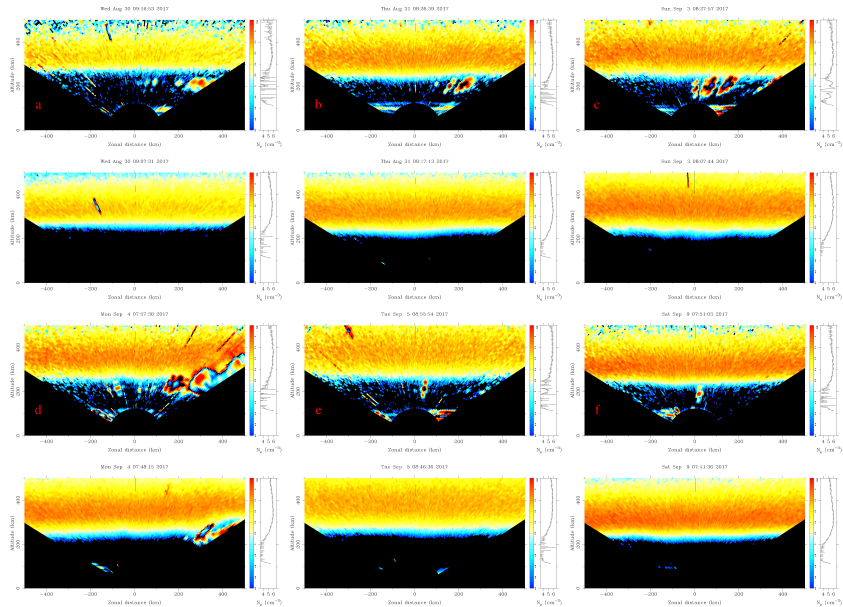
Mar. 22 simulations: 1900 LT, 2040 LT



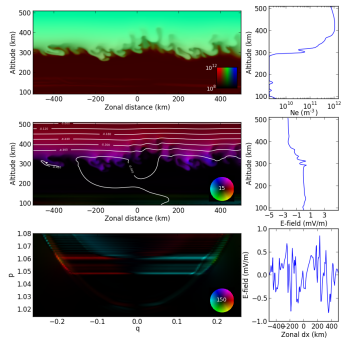
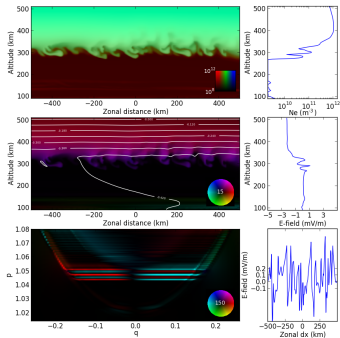
Mar. 23 simulations: 1900 LT, 2040 LT



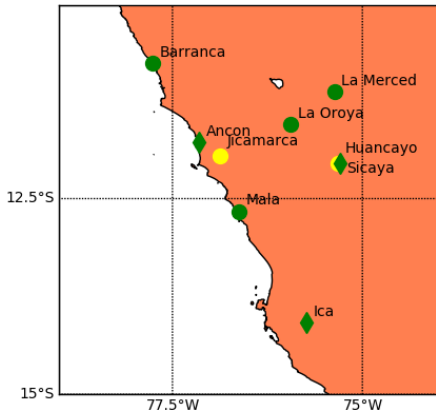
ALTAIR/ WINDY

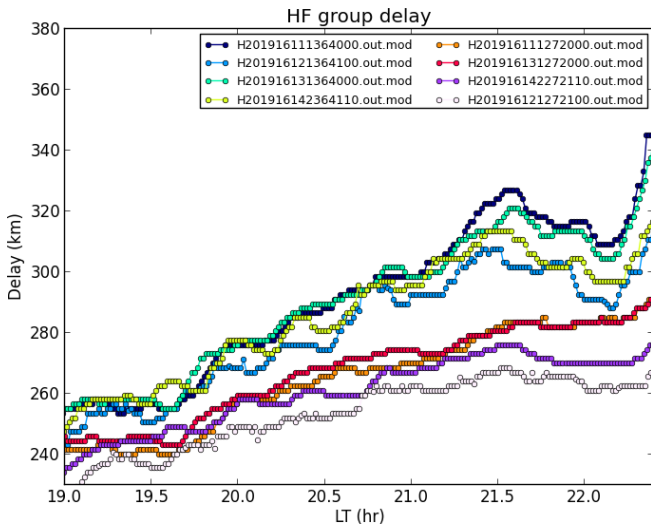


simulation w/o and w/ seeding



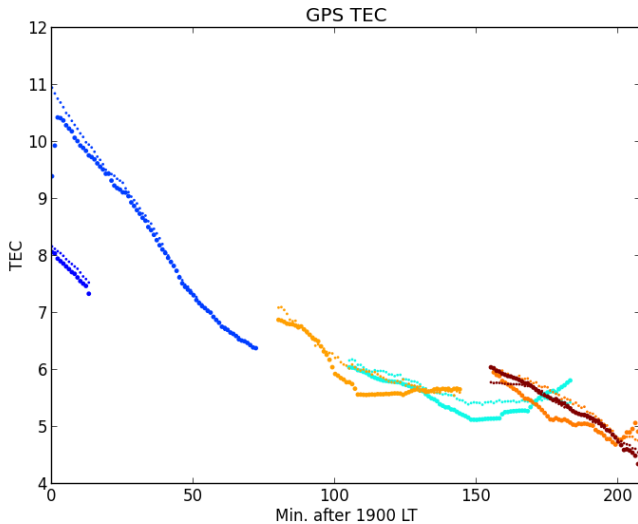
HF beacon sites





June 10, beacon data reconstruction

GPS TEC included this time



- ESF driven by variants on simple collisional interchange instability.
- Details are critical; inclusion of shear flow, vertical currents, and non-equipotential magnetic field lines important for accurate modeling.
- Irregularity seeding perhaps not too critical in determining overall day-to-day stability.
- However, seeding possibly critical for establishing large-scale irregularity morphology.
- Should be possible to assimilate HF beacon data in numerical simulations to predict individual plume locations and rates of development and movement.