

A San Marco/Jicamarca Study of Equatorial Spread F

M. C. Kelley
R. F. Woodman

Over the years a number of experimental techniques have been employed to understand equatorial spread F (ESF). The field is by now very advanced as is our understanding of the relationship between the Jicamarca Radar Maps and in situ measurements. This is important since the ground based data is less expensive to obtain and is available over seasonal and even solar cycle time basis. The advanced understanding has come primarily from rocket/radar, satellite/radar and theoretical studies. Our purpose is to continue this approach with regard to what we consider as the two most important problem areas in ESF today:

1. Long wavelengths. How does gravity wave seeding and shear instability shape the long λ part of the horizontal spectrum?
2. Short wavelengths. Under what conditions do lower hybrid drift waves exist?

To study this we would operate the Jicamarca radar in a power map mode with bursts of the interferometry mode when San Marco is overhead. The maps will yield a time history of the event while the San Marco will yield high resolution cuts through the structure. Satellite data of interest include

1. Drift meter velocity and ion density
2. Electric fields ac and dc
3. Neutral wind structure at large scales

Data exchange should occur within a few months of the campaign. It is anticipated that joint analysis and publication of the results will occur with several NASA funded scientists.

Due to teaching schedules and the vagaries of ESF occurrence over Jicamarca, we anticipate two week-long campaigns—one in January 1987 and one in March, 1987.