

# Mars Ionospheric Research at Boston University

Purpose – An overview of  
collaborative research between  
Boston and Cologne

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Combined MEX/VEX  
Radio Science Team Meeting  
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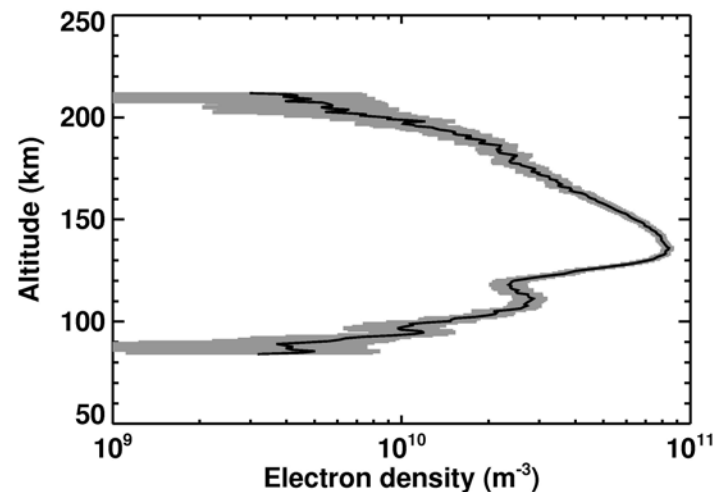
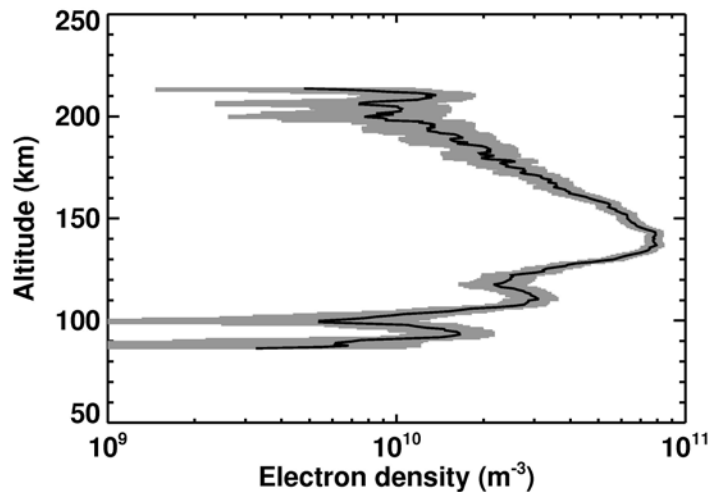
# Numerical Simulations

- December 2004 – Many MGS and MEX RS profiles in opposite hemispheres. First opportunity to simulate large-scale spatial variations.
- Effects of solar flares on ionosphere. Rapid changes to lower ionosphere, electron-impact ionization is vital.
- Topside ionosphere,  $O^+$  and  $O_2^+$ .

# Meteoric Layers

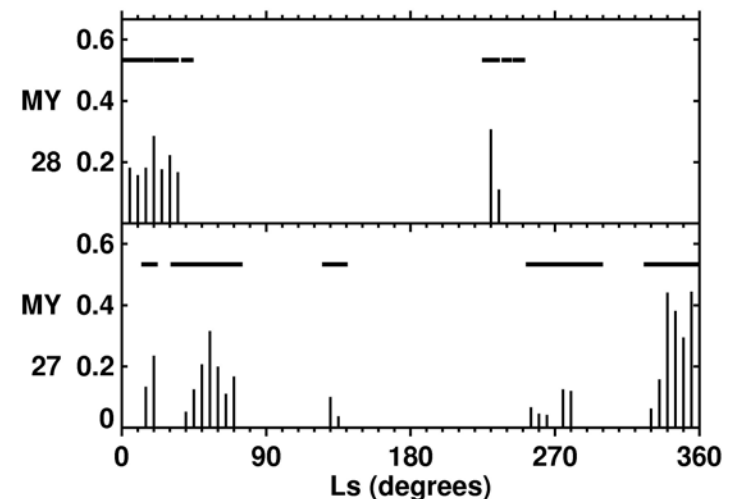
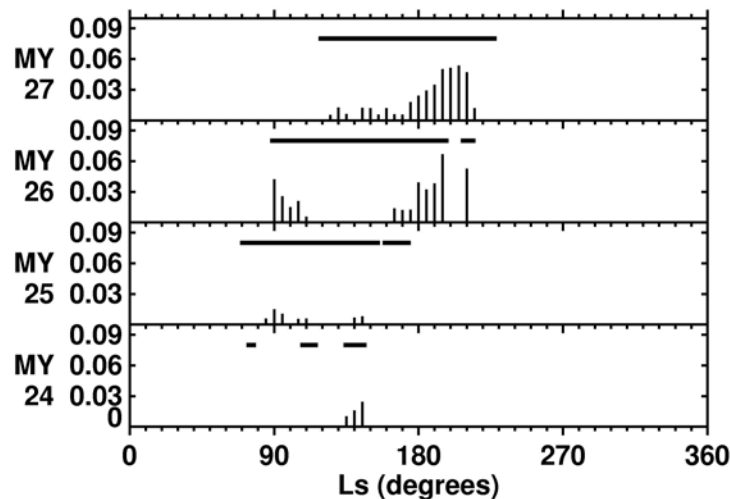
## Height, Width, Electron density

- 92 km altitude, 10 km wide,  $1E10 \text{ m}^{-3}$
- These physical characteristics are correlated with each other ( $r=0.4$ ), but not with anything else, such as SZA.
- Numerical simulations needed



# Meteoric Layers - Occurrence Rate

- 10x more common in MEX profiles than in MGS profiles, different measurement uncertainties are (partially? fully?) responsible.
- Occurrence rate varies by 10x, seems to be seasonally-dependent due to meteor showers associated with parent comets.



# “The Great Escape” – TGE

- “The Great Escape” is one of two finalists in NASA Mars Scout program for launch in 2013.
- Selection expected this week.
- Boston and Cologne are collaborating on a radio science experiment that is very similar to MGS RS.