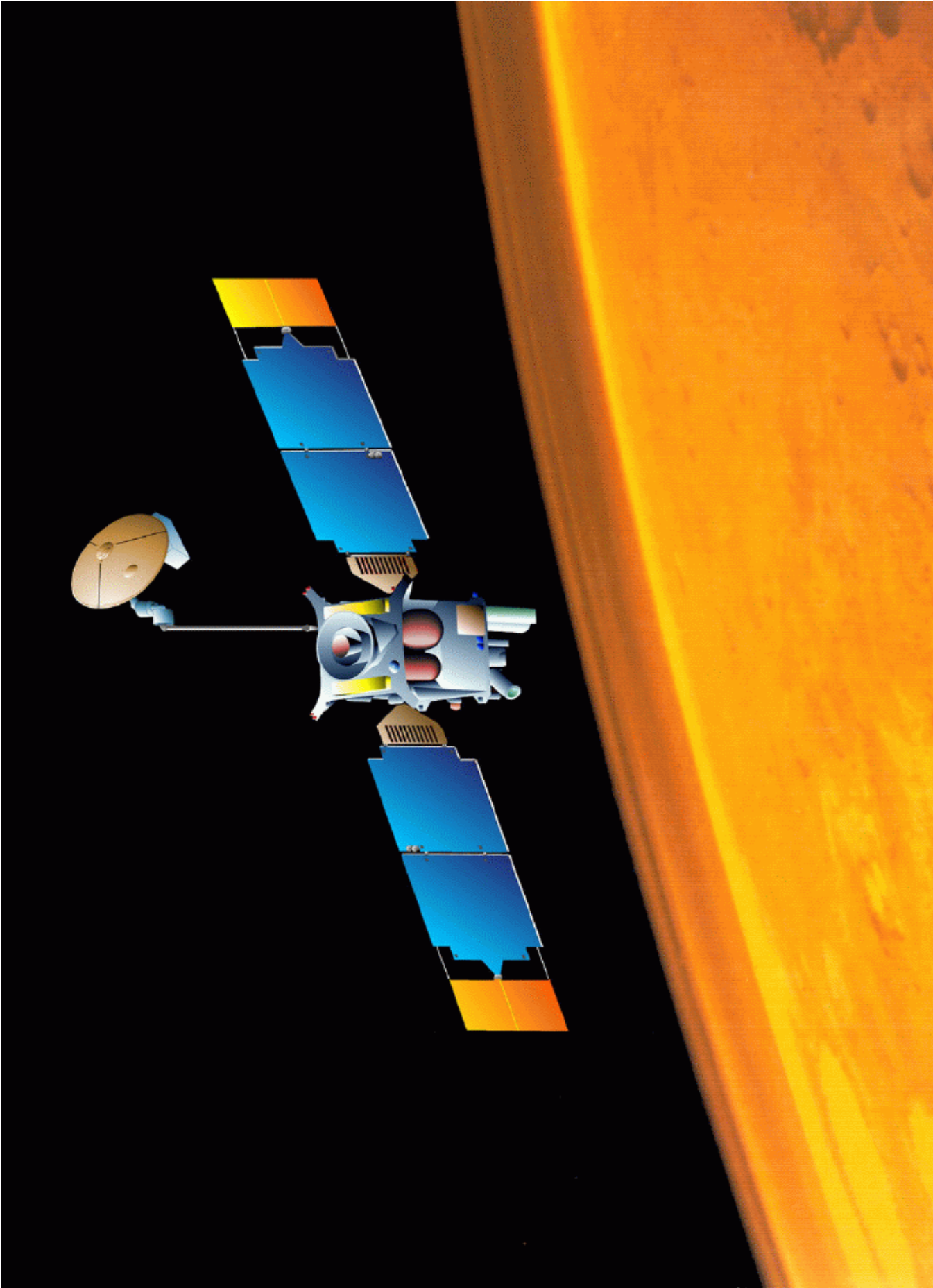


The Martian Upper
Atmosphere as Revealed
by Mars Global
Surveyor's Aerobraking

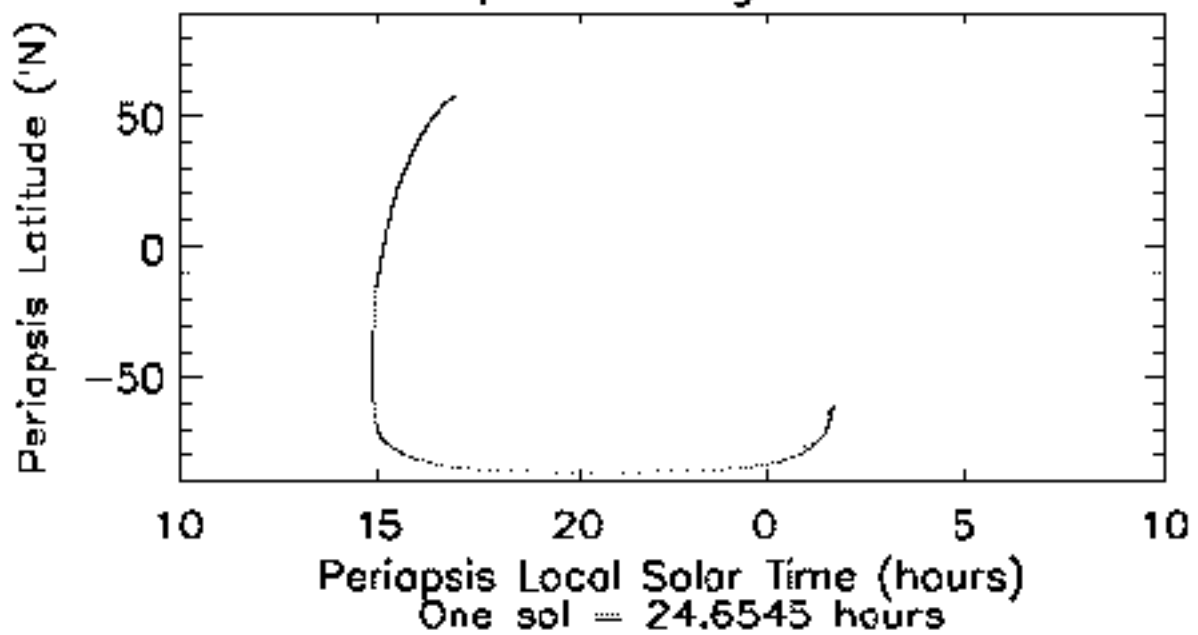
Paul Withers & Steve
Bougher

LPLC II

19 May 1999



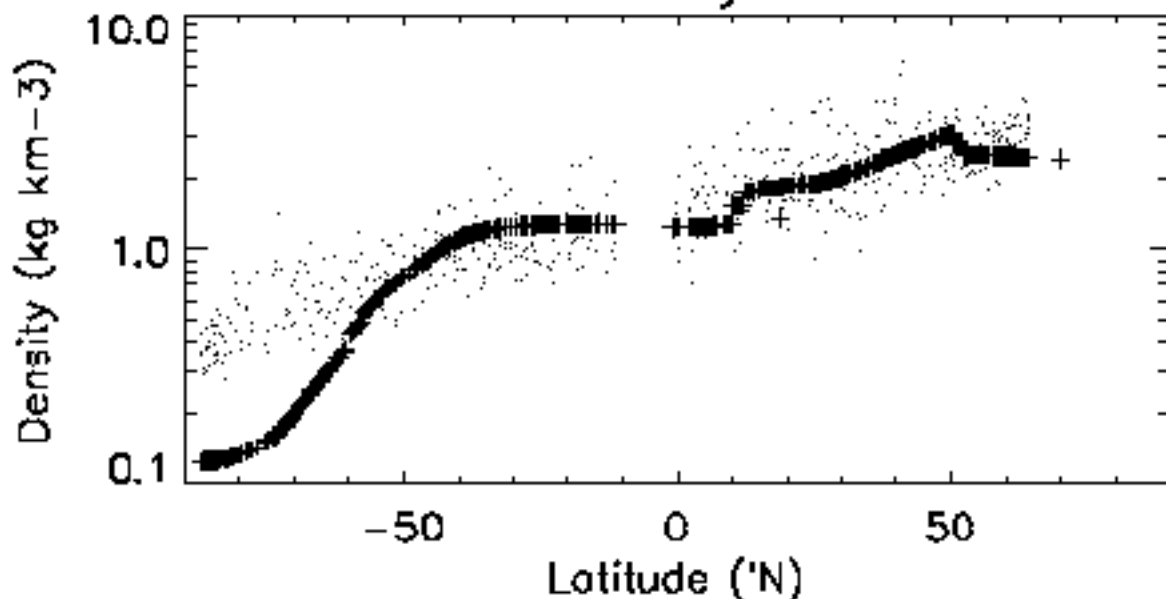
Periapsis during Phase 2



Data and Predictions

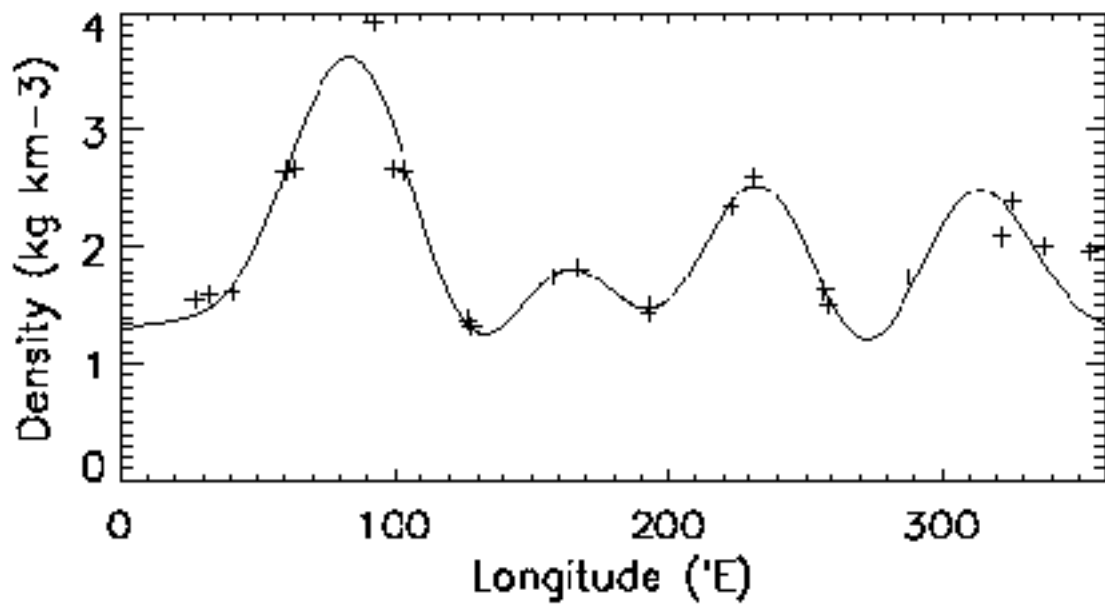
- Density, density scale height & temperature at 130 km (in & out) and periapsis (100-110 km)
- Mars Thermosphere Global Circulation Model predicts mean atmospheric behaviour
- Predictions cover \sim 1 month

Outbound Density at 130 km

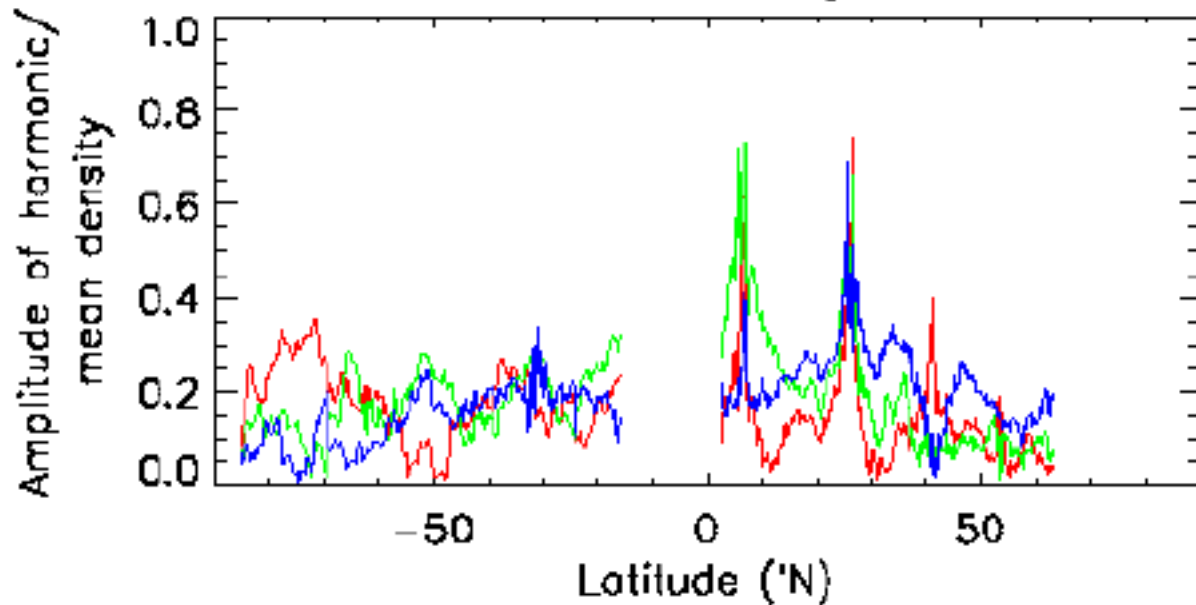


Complete Phase 2: Orbits 574 - 1283
• = MGS, + = MTGCM

Wave-5 fit to outbound densities at 130km
25 orbits P824 - P848, 13 - 19 'N

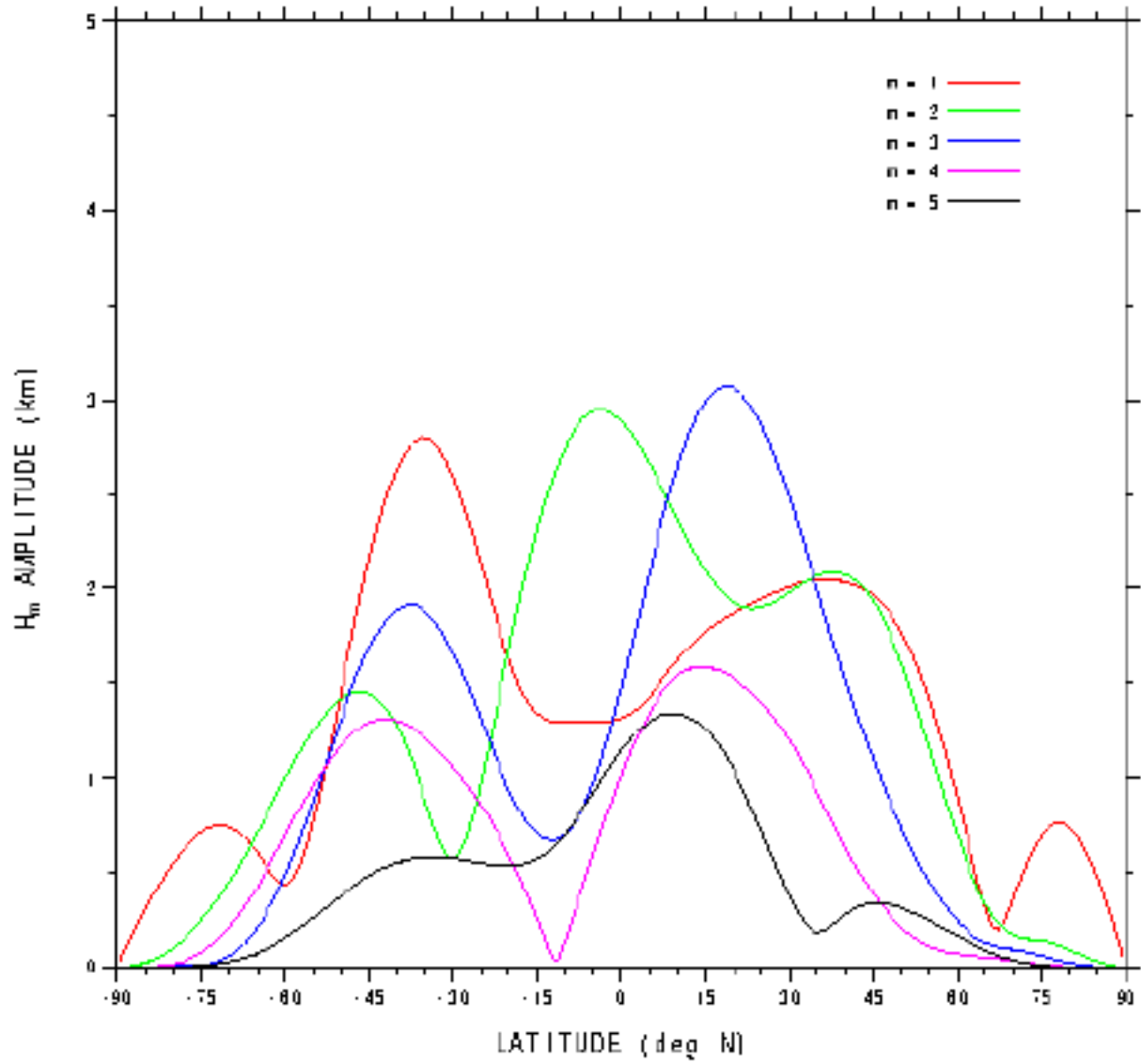


Wave-5 fits to outbound densities at 130 km
25 orbit running means



wave1=red, wave2=green, wave3=blue
waves4 and 5 omitted for clarity

SMITH-ZUBER TOPOGRAPHY, Zonal Wavenumbers $m = 1-5$



Points to remember

- Unexpected stationary longitudinal variations mean surface effects propagating up over 100km
- Mid-latitude models useful
- Polar night badly modelled