Paul Withers, Steve Bougher, and a cast of thousands

Longitudinal structure in the martian upper atmosphere as discovered by MGS

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Mariner 6/7/9: UV spectrometer, radio occultation

Mars 4/5: Lyman-α photometer, VIS spectrometer

Mars 6: entry profile

Viking Orbiters: radio occultations

Viking Landers: ion density, mass spectrometer, entry profile

Phobos 2: UV/IR occultations, ionospheric measurements

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- Mars Pathfinder:
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Martian seasons: solar distance and sub-solar latitude

Latitude, longitude, and local solar time

11 yr solar activity cycle

27 day solar rotation

Sporadic solar flares

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Oct 97 - Mar 98: Phase 1

Perihelion, S spring

30’N - 60’N, 6pm decreasing to 11am

Apr 98 - Sep 98: SPO

pretty pictures taken

Oct 98 - Jan 99: Phase 2

Aphelion, N spring

60’N - S Pole - 60’S, 5pm decreasing to 3pm then jump to 2am

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Going to talk about: Variation in longitudinal structure with lat, lst, season, and on 2 week timescale

NB - Zonal mean predictions adequate, systematic error present, polar predictions particularly poor

Conclusions

- Longitudinal structure => upper atm contains info about rest of atmosphere.
- Implications for better understanding of some geological processes as well as atmospheric ones.
- First measurements of intrinsic variability of upper atmosphere.