

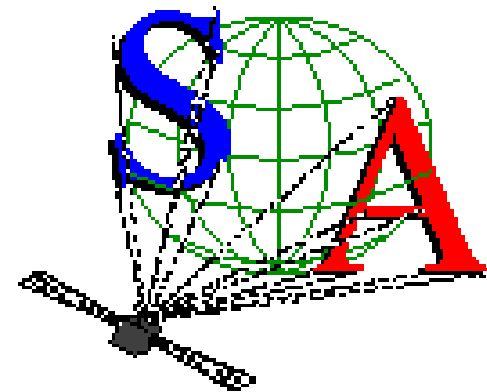
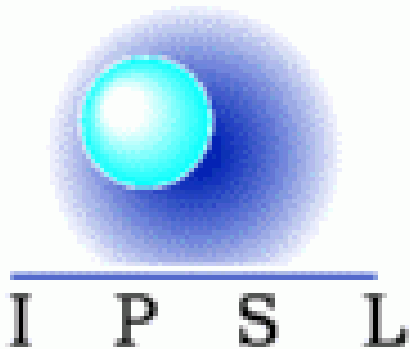
New Observations of UV Airglow in the Upper Atmosphere of Mars with SPICAM on Mars Express

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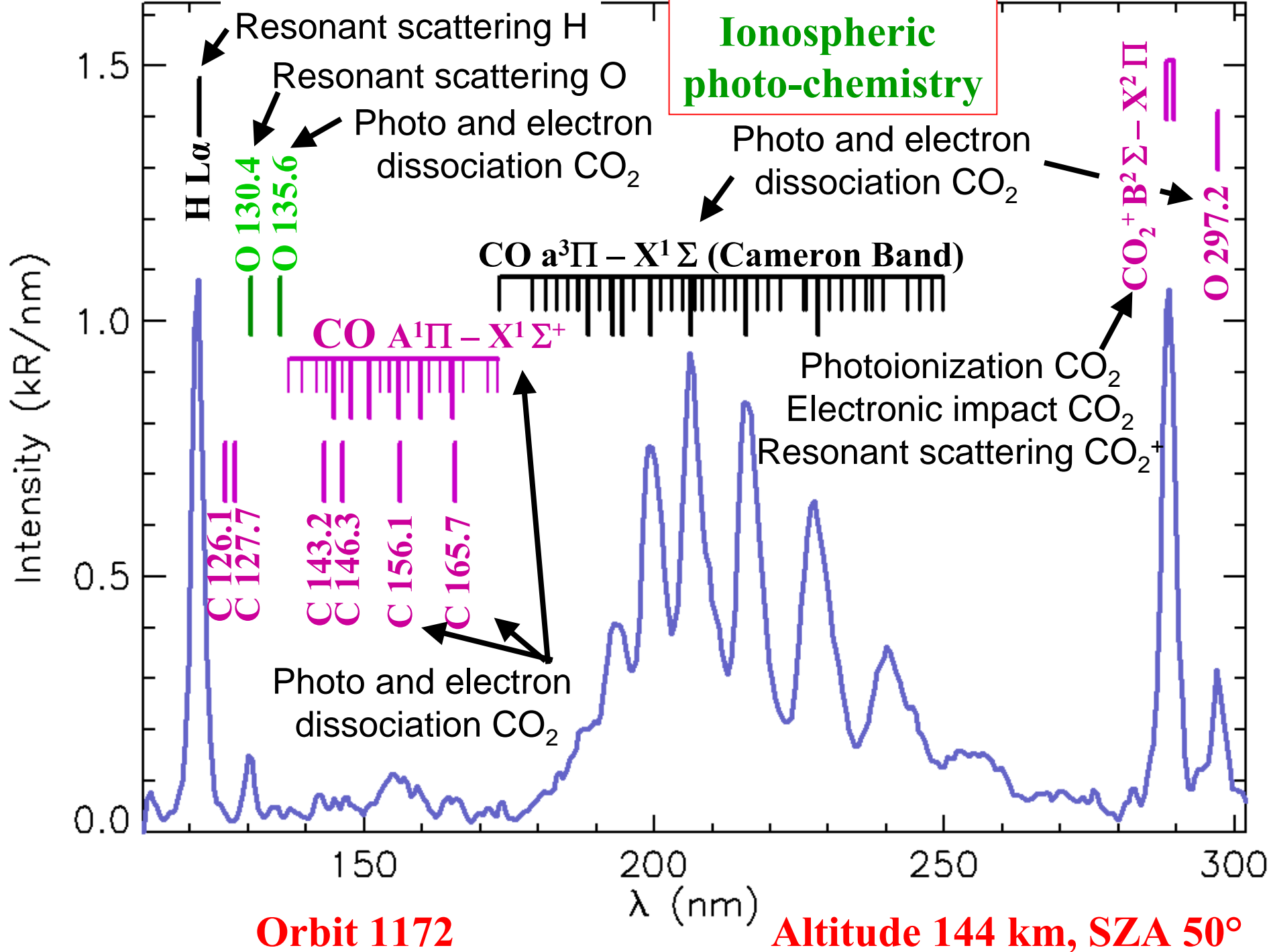
1 Service d'Aéronomie du CNRS/IPSL, France

2 ESA-ESTEC, The Netherlands

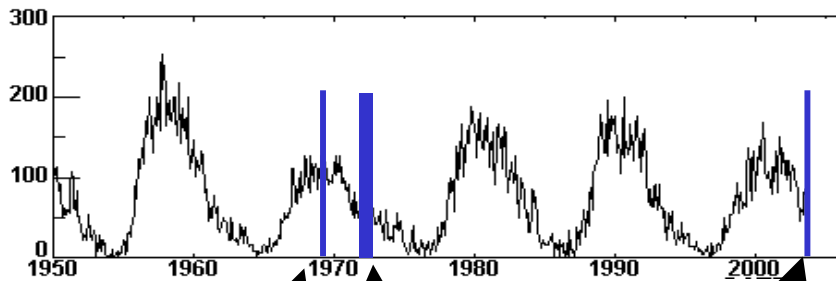
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FIRST MARS EXPRESS SCIENCE CONFERENCE



Monthly averaged sunspot number



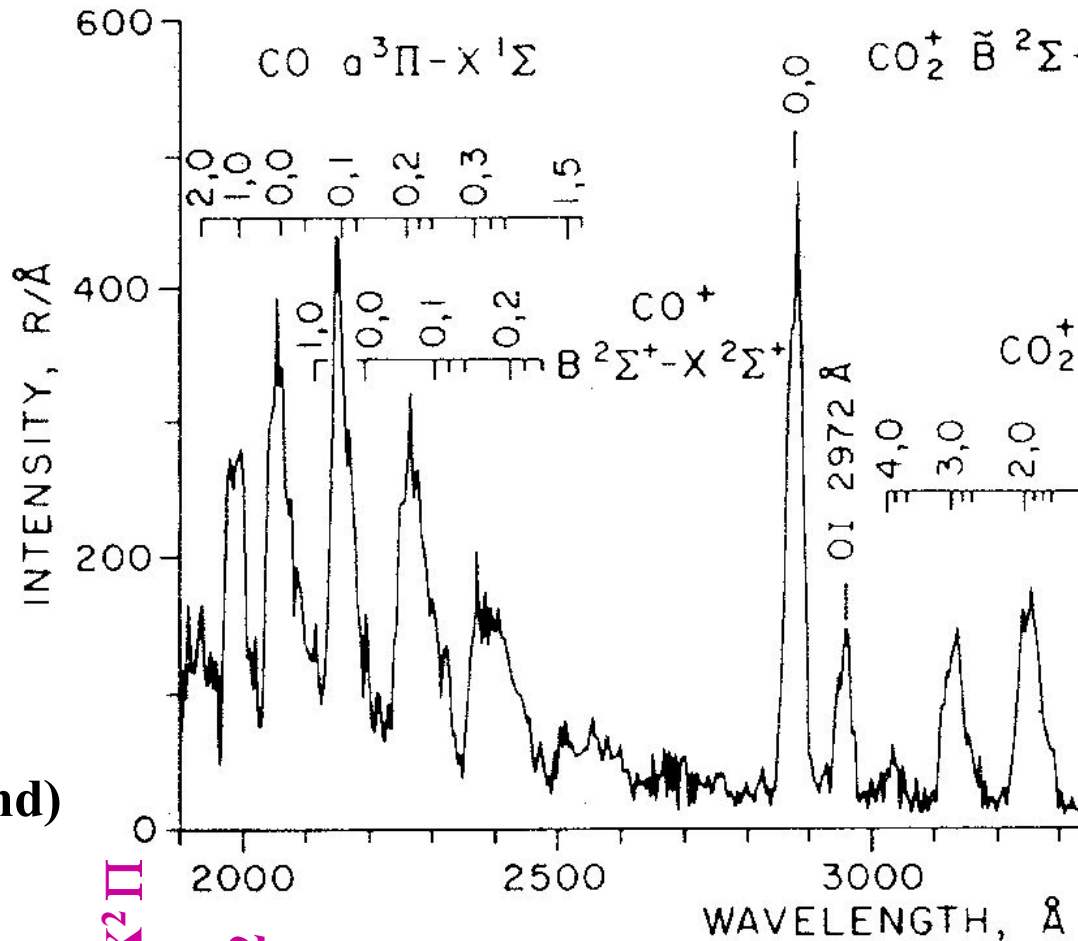
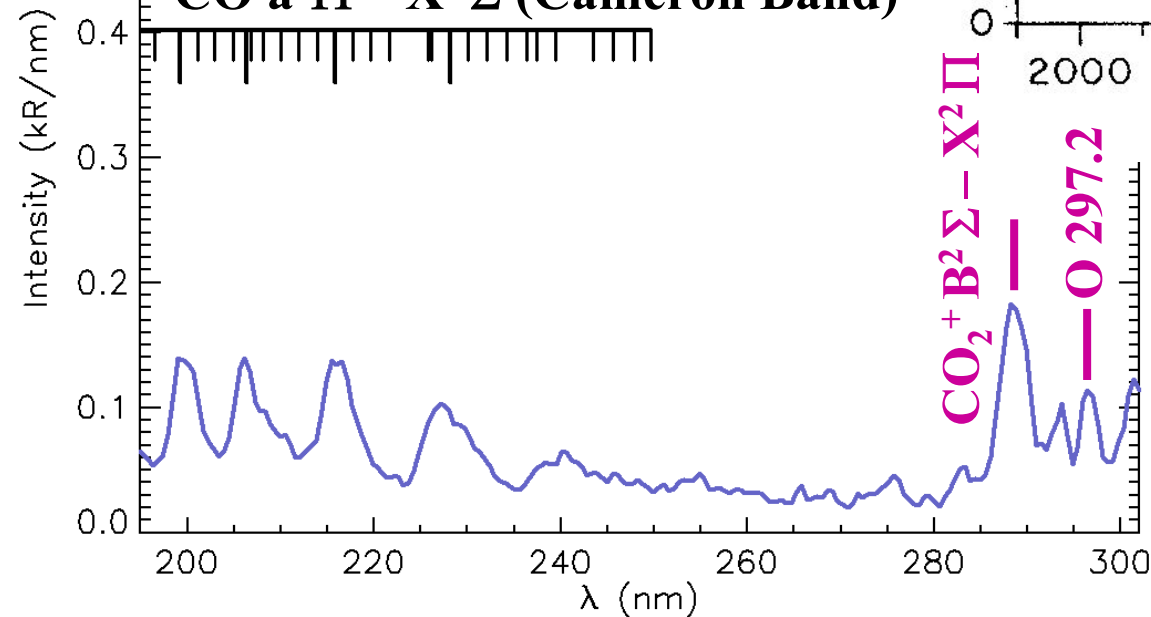
Mariner 6, 7 Mariner 9 MEX

Orbit 947

Altitude 160-180 km

SZA 37°

CO $a^3\Pi - X^1\Sigma$ (Cameron Band)



Mariner 6, 7

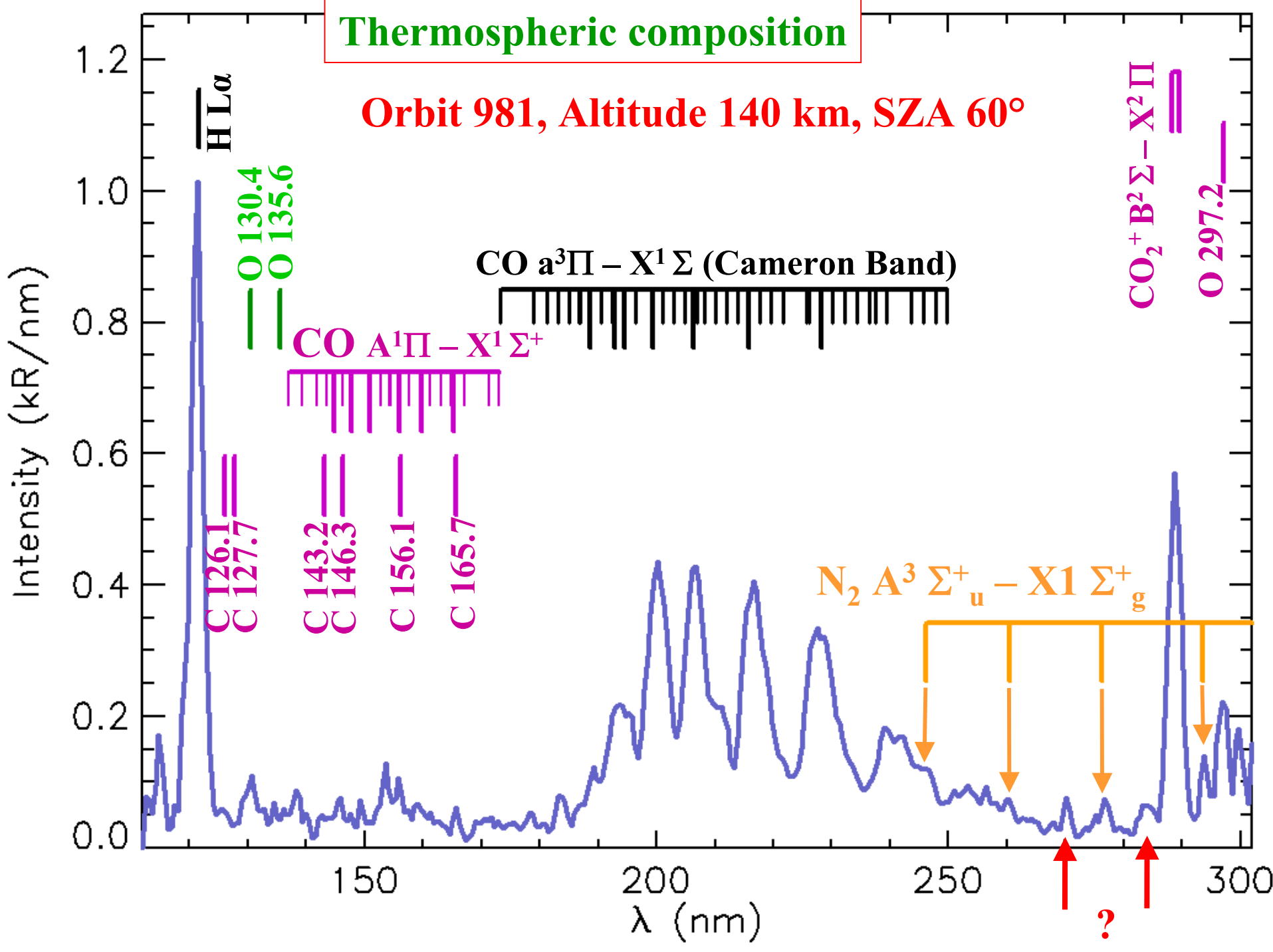
160-180 km

SZA 27°, 0°, 44°

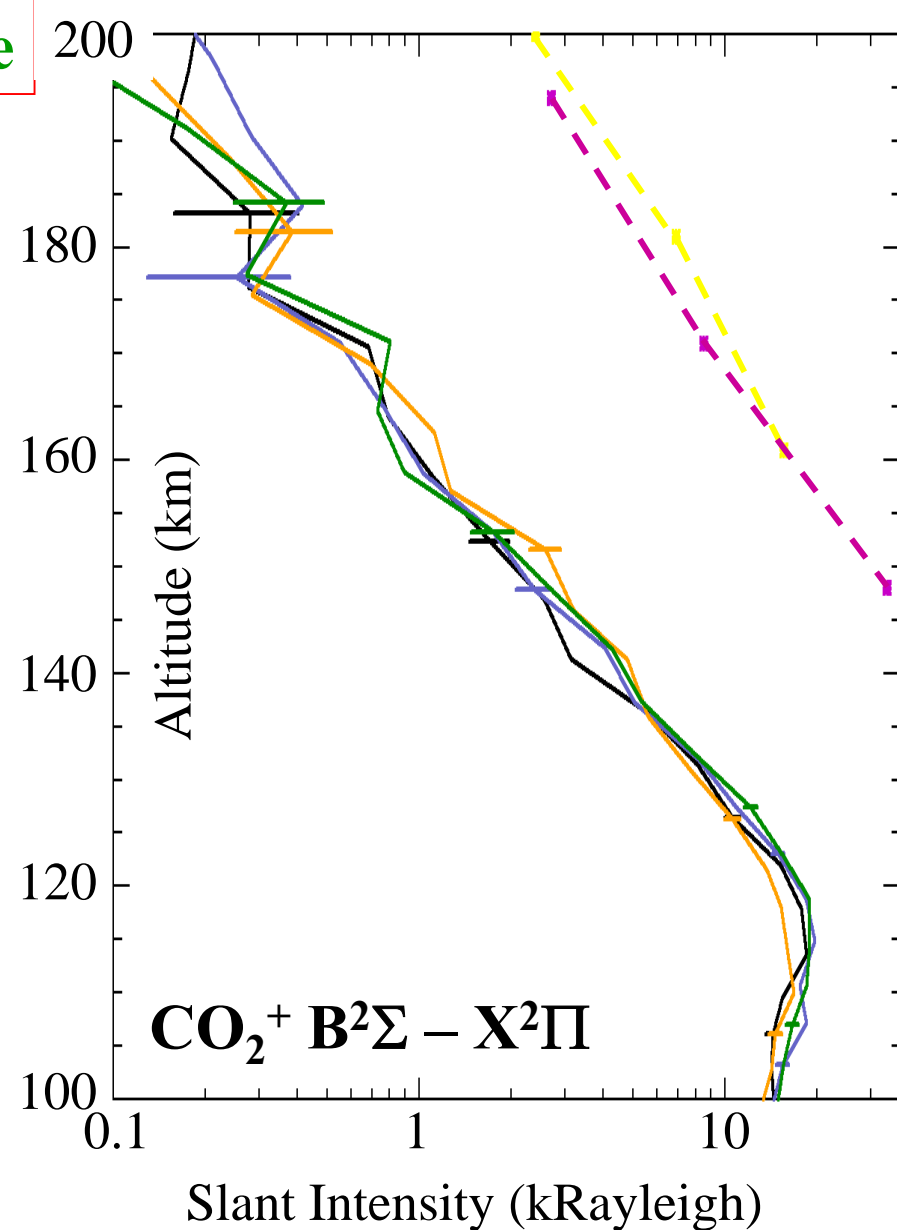
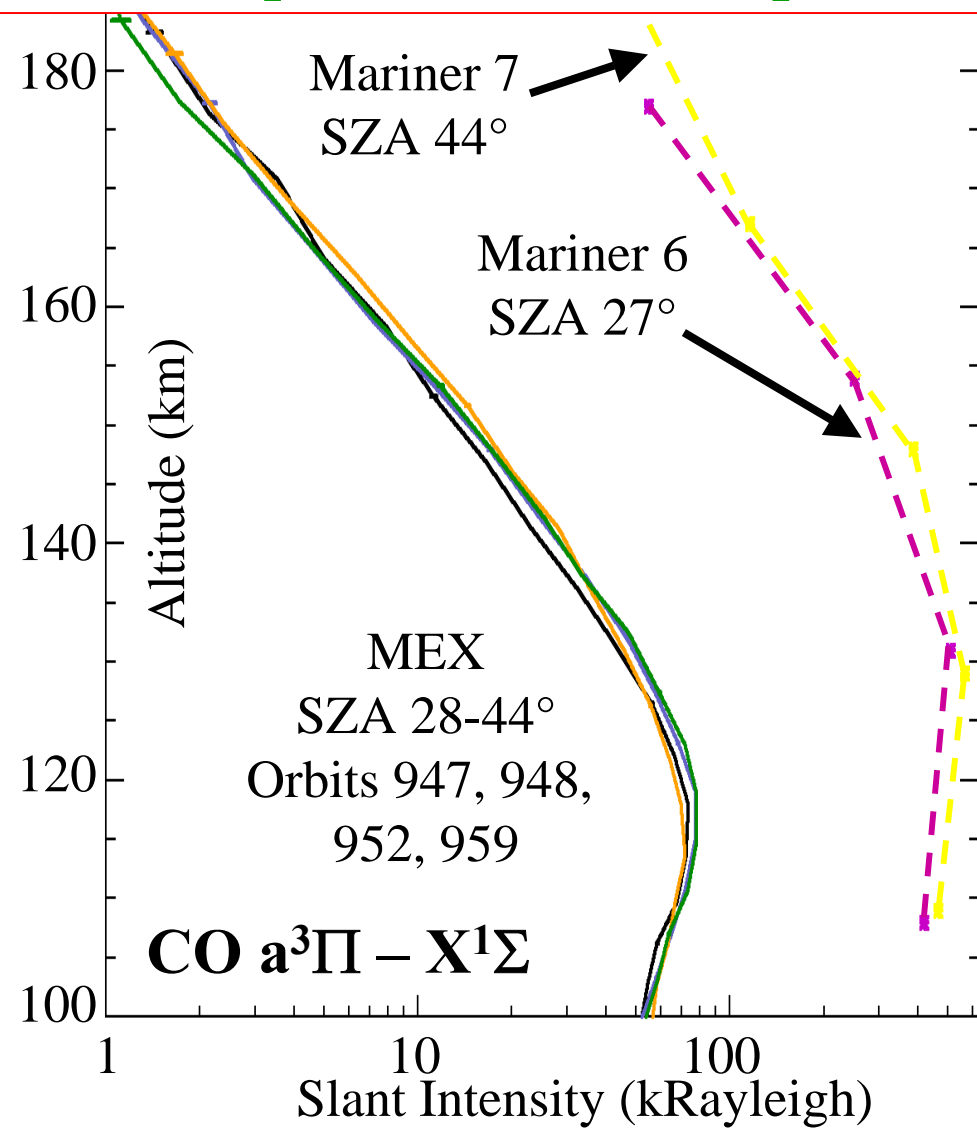
Seasonal variations

Thermospheric composition

Orbit 981, Altitude 140 km, SZA 60°

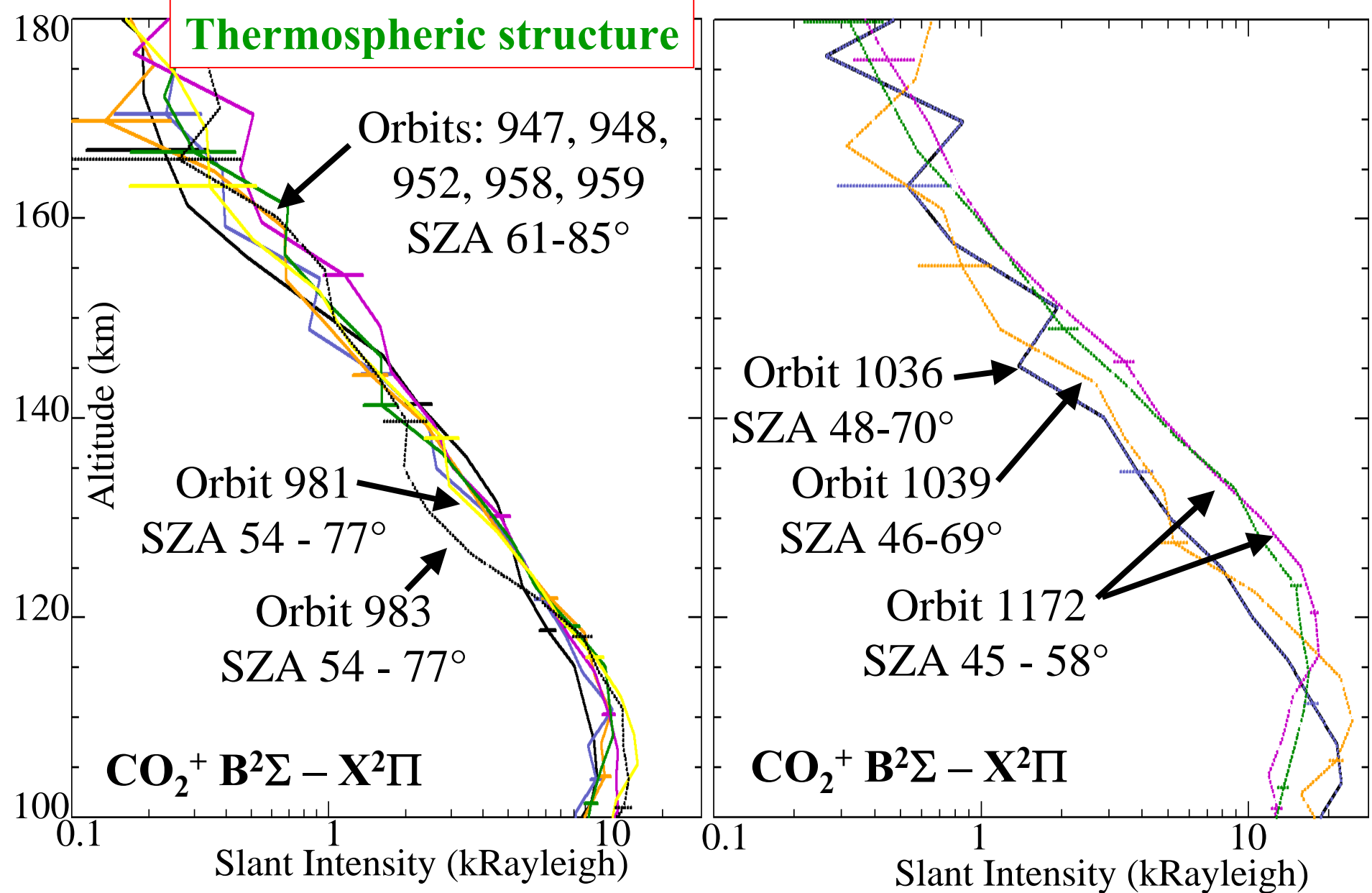


Thermospheric neutral temperature

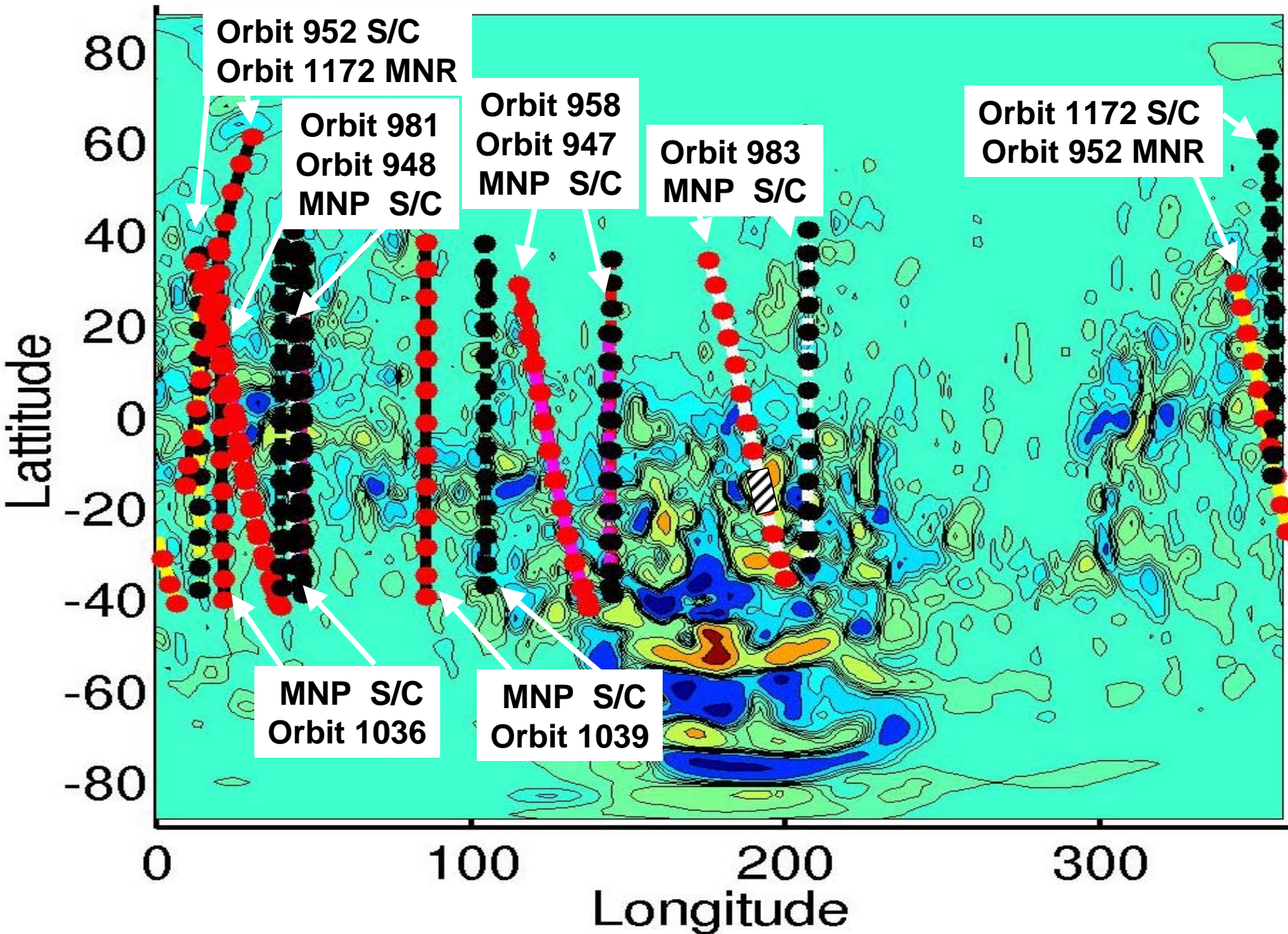


CO a-X and CO₂⁺ B-X scale height (~31 km) and peak altitude (120 km)

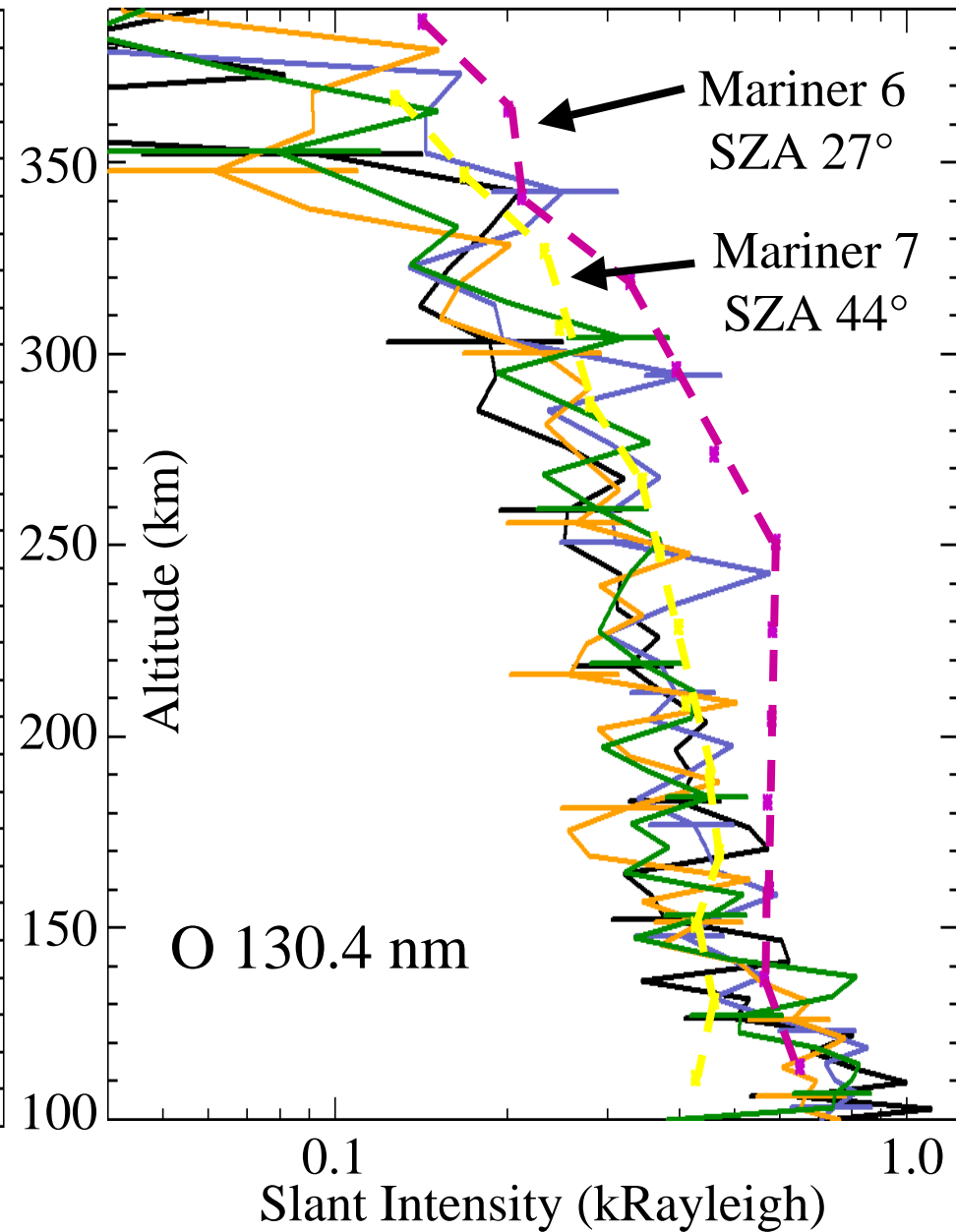
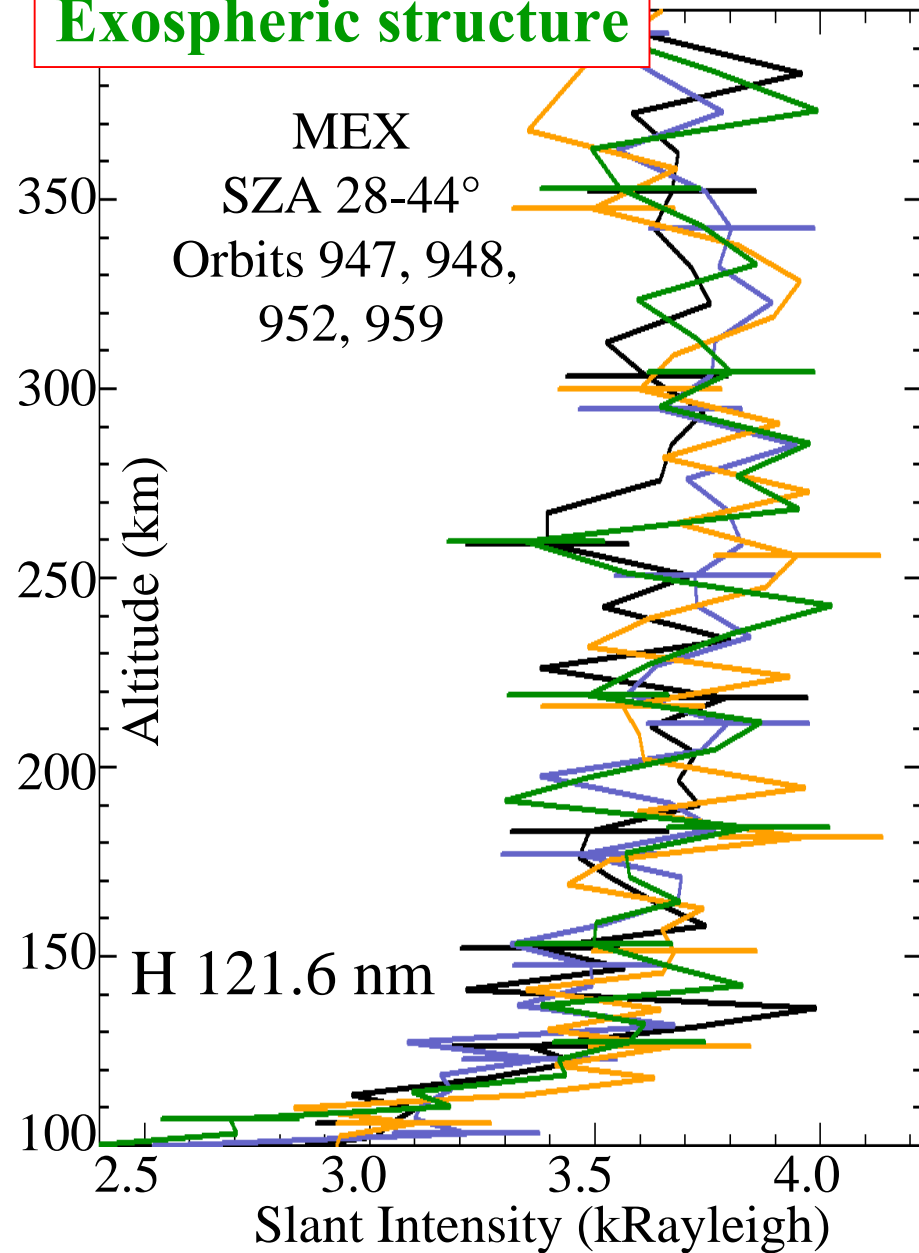
⇒ Neutral temperature < than Mariner (scale height ~37 km, peak altitude 130 km)



- Variation of the thermospheric emission vs SZA
- Variation of the thermospheric emission vs crustal magnetic field



Exospheric structure



O emission: same altitude variation and intensity than for Mariner 6, 7

Conclusions

SPICAM observation of the Martian thermosphere and exosphere

gives elements:

- To characterize the thermosphere density and temperature
- To constrain the reactivity of the thermosphere vs solar conditions and understand the nature of Mars/Solar Wind interaction (the role of the crustal field)
 - To understand the sources of the exosphere
 - To constrain the mechanisms of escaping loss