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# Study of the oxygen dayglow in Martian atmosphere with the Planetary Fourier Spectrometer on board Mars Express

A. Geminale and V. Formisano
IFSI, IFSI-INAF, Rome, Italy (anna.geminale@ifsi-roma.inaf.it)

PFS-MEX has measured the oxygen emission caused by the ozone dissociation produced by solar UV radiation. We have observed the emission both in limb and in nadir measurements. Different aspects of the emission have been studied with the two datasets.
LIMB measurements: we obtain from an average spectrum many emitted lines, not only the Q-branch. 11 lines have been identified from the Qr band, 11 from the Rr band and 9 from the Rs band. 5 bands have been identified from the Qp and from the Qr , while from the Pp only 3 lines have been identified. In total at least 44 lines have been identified. The observed intensities follow the Hitran line intensities.
The emitted radiation appears to come from 3 main emitting layers: one at 10 Km altitude, but with variable line intensities, one from 25-30 Km altitude, and one from the 55-60 Km altitude. Sometimes the highest layer appears to have the largest rotovibrational temperature, sometime is the lowest layer to have the highest rotovibrational temperature.
The oxygen emission is anti-correlated with the presence of water vapour: the spectra showing O2 emission have practically zero water mixing ratio.
NADIR measurements: we have used averages over 15 spectra of PFS. The spectra have been divided for the continuum. A strong air mass effect is observed as with the Solar Zenith Angle we have large variation of the continuum, and this results in a large amplification of the NER. After correction for the air mass we have still a large variation with latitude, the emission being of the order of 1-2% of the continuum, but at the northern polar regions can reach 5-6 % of the continuum. The seasonal study shows a maximum in the northern polar regions after the end of northern summer and, at south, a similar maximum (but more toward the equator) at the end of the southern summer and beginning of northern spring.