O3 APPARENT ABUNDANCES AS SEEN BY THE OMEGA/MEX INSTRUMENT. F. Altieri[1] , L. Zasova[2], G. Bellucci[1], F. G. Carrozzo[1], E. D'Aversa[1], G. Gondet[3], and J-P. Bibring[3], [1]IFSI – INAF, via del Fosso del Cavaliere 100, 00133 Rome, Italy, francesca.altieri@ifsi-roma.inaf.it. [2]Spase Research Institute, Moscow, Russia. [3]Institut d'Astrophysique Spatiale, Bât. 121, Université Paris-Sud, 91405 Orsay Cedex, France.

Introduction: In this work we report about the O_3 apparent abundances as derived from the O_2 emission observed at 1.27 micron [1, 2] in the OMEGA data [3] from the beginning of the mission, January 2004, up to November 2006 (Ls 95°). The O_2 emission on the day side is produced as a result of photolysis of O_3, 90 % of ozone molecules produce oxygen at a¹Δ$_g$ state; then there are two ways of de-exitation of the O_2: by the emission (97% of emission in 1.27 micron band and the rest in 1.58 micron) or by collisions with the CO_2 molecules at altitudes lower than 20 km. Although ozone is one of the minor constituents of the Martian atmosphere, its study is crucial to understand the photochemistry of the planet, in particular the OH_x radicals. The OMEGA results will be compared with the SPICAM measurements [4, 5], the other instrument on board Mars Express devoted to the ozone study.

Nadir Observations: Nadir observations are used to study the seasonal and latitudinal behavior of ozone (Fig. 1). Since below 20 km O_2 is probably quenched by the collision with CO_2 and dust particles, the nadir observations allow to derive only the integrated abundances of ozone above this level (so called apparent abundance). High concentrations of O_3 are observed in the Northern hemisphere between latitudes 50° and 90° around Ls 0° (in spring) and less pronounced maximum 160° - 180° (in autumn); in the Southern hemisphere around Ls 130° and 200° (spring), and probably at Ls around 0°. Ozone is present also in the equatorial region starting from Ls 20° at the second Martian year of the mission. An increase of ozone in the equatorial region is also observed during the first mission year in the Northern summer, at Ls between 90° and 180°, and in the middle of the northern winter between Ls 260° and 320°. Gaps in the seasonal and latitudinal coverage are due to the lack of OMEGA observations in corresponding periods.

Limb Observations: The OMEGA limb observations are used to sound the ozone profiles in the atmosphere on the day side. Unlike SPICAM instrument, OMEGA cannot obtain the limb profiles during the night (the signal is too low), so we are not able to observe the nighttime O_3 layer. On the day side the main ozone layer lays below 40 km. Nevertheless, sometimes, a second layer appears at higher altitudes (above 40 km) in the morning profiles, probably due to an enrichment of ozone at higher altitude thanks to atmospheric waves [6] or to a residual of the nighttime layer.

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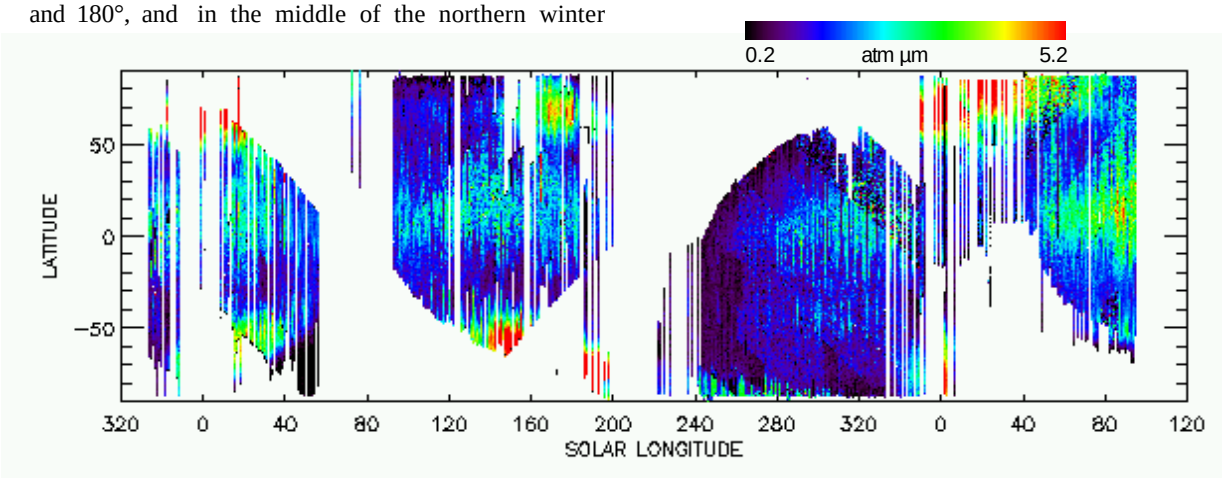

Figure 1. Latitude-season distribution of the apparent ozone abundances on Mars as derived from the 1.27 micron emission band of O_2 from the OMEGA nadir data set.