**ATMOSPHERIC PHENOMENA OBSERVED BY OMEGA/MEX OVER HIGH LATITUDES.** B. Gondet,

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**Introduction:** Since the beginning of the mission (January 2004) OMEGA, the VIS-NIR hyperspectral imager onboard Mars Express has acquired regular high latitudes observations in conjunction with others instruments (HRSC, PFS, SPICAM and VMC) in nadir and limbs modes. Atmospheric phenomena are observed detected at different Ls, altitude, locations and local time,. This constitutes an important database largely unexploited at this point. We will present examples of detections concerning clouds, dust and emissions, and identify themes of potential collaborations.

$H_2O$ and $CO_2$ ices evolution will be also discuted in this meeting by Yves Langevin.

**Examples of available observations:**

All observations of the spatial distribution of clouds and dust, either lateral of vertical, come with compositional spectral measurments covering the 0.4 to 5.1 microns range for most observations. All the pictures below are RG (500nm, 700nm and 900nm) with the same normalisation

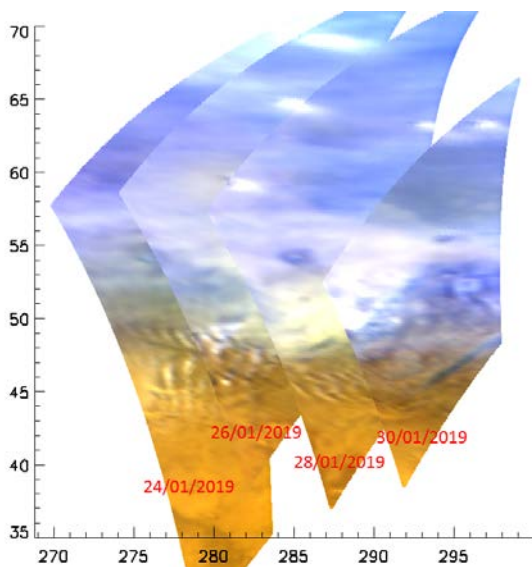Gravity waves [1], [2] are observed at 2 periods: Ls~310° (fig1) and LS~35° fig (3,4).



Fig 2 and Fig 3 Gravity waves obsersed at LS 35° ( 2019 and 2005).



Fig 1: Gravity waves observed at Ls 310°(2019). The altitude of the clouds are ~80 kms (Thanks to the shadow of the clouds)



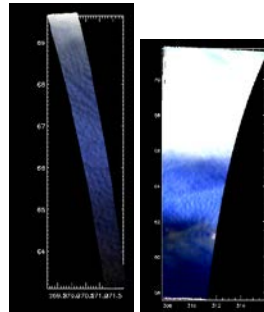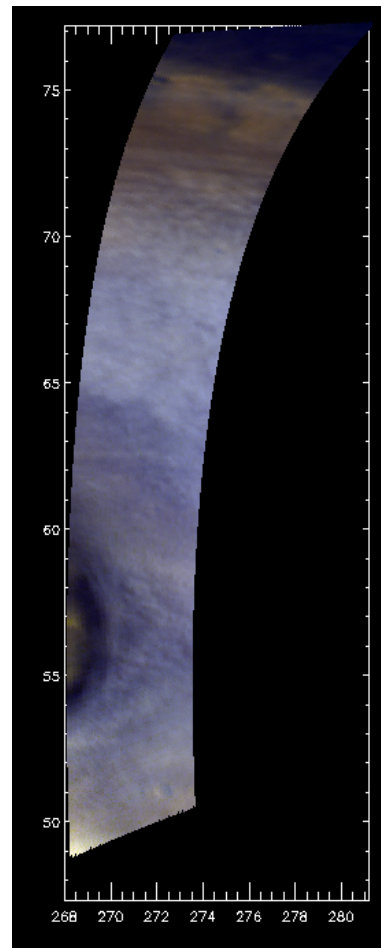Fig 4: double Vortex (2018). This vortex as been also observed by VMC and HRSC ([3])
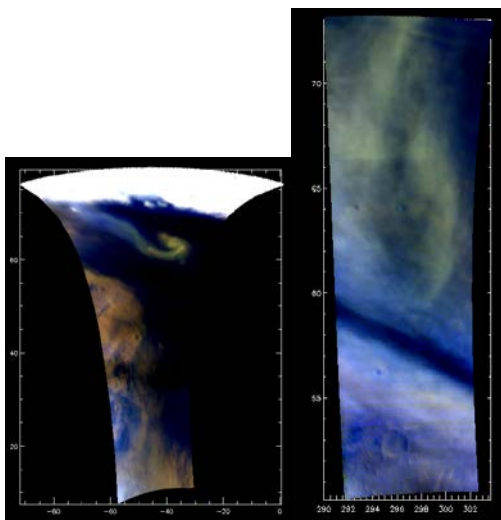
Fig 4 and fig 5: dust storms at high altitude

**References:**

[1] Hauchecorne, A.. *Geophys. Res. Lett.*, 14, 933– 936 [2] Spiga, A. *GRL Volume 39, issue 2*, [3] Sánchez-Lavega, A. *Journal of Geophysical Research: Planets, Volume 123,*

**Discussion and Conclusion:**

OMEGA measurements gathered over more than 16 years offer an opportunity to explore the yearly variability of the Martian atmosphere over the north latitudes, with sufficient time sampling or spatial coverage to put constrains on several aspects of the atmospheric dynamic. OMEGA still provides unique aerosols compositional characterization capabilities that enable detailed analyses of CO2 clouds and other poorly known high altitude aerosols layers. Ongoing and upcoming collaborations with the Martian atmospheric community will further reveal the richness of this dataset for atmospheric studies.