**Gravity aspect reveals more differentiated southern hemisphere that northern hemisphere of Mars.**

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**Introduction:** We use the gravity aspects (descriptors) to study features on Mars. They are derived from the gravity field models of Mars (sets of spherical harmonic expansion of disturbing gravitational potential in terms of harmonic coefficients, also known as Stokes parameters) [1].

**Results:** Gravity aspect related to second derivative of the gravity potential revealed a significant difference in the crustal density distribution near the poles of Mars. Specifically, while the north and south polar crust region have similar distribution of gravity potential difference (-250 mGals to 350 mGals), related to first derivative of gravity potential ($\Delta g$, see [1] for exact definitions), the northern region has significanly increased second derivative of the potential ($T_{zz}$ see [1] for exact definitions), compared to southern crust polar region (Fig. 1).

**Discussion:** Northern and southern crust of Mars relates to Mars dichotomy. Northern crust has significantly lower elevation compared to southern crust of Mars. Our data indicate that the northern crust have near surface bodies with density contrast as much as 3 times larger than near surface crust in the southern polar region. Larger density contrast is consistent with the northern hemisphere being less differentiated, with contrasting densities, than the southern hemisphere with more uniform densities.

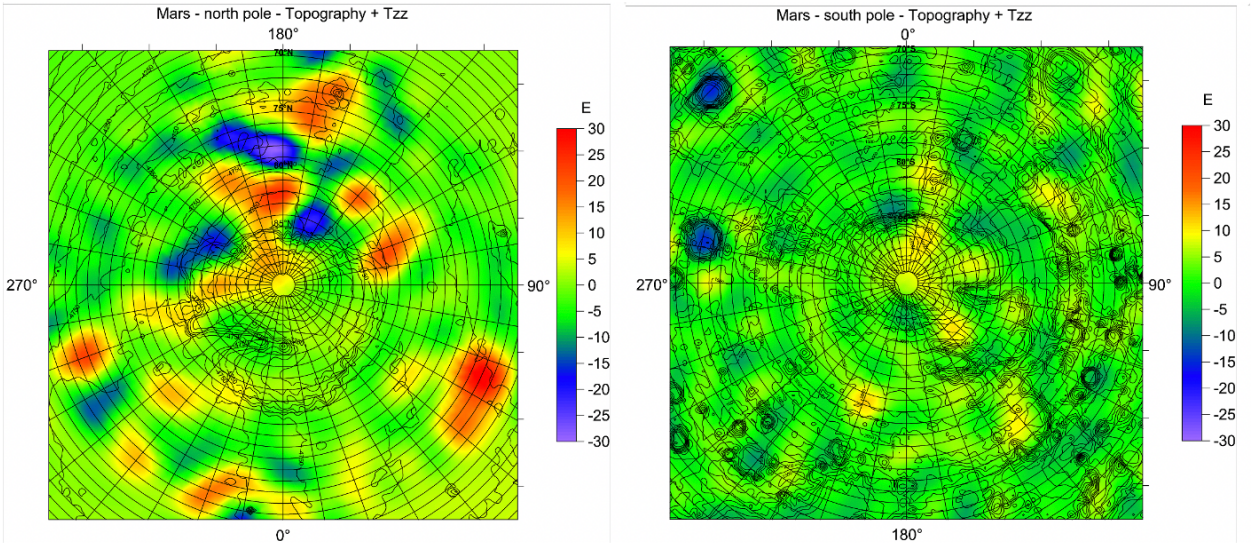


Fig. 1: The second derivative of the gravity potential $T_{zz}$ [Etwos] in the polar regions of Mars. Plots are based on the global gravity field model JGMRO_120F [2]. Countours are from the MOLA MGS topography (black contours in [m] above reference surface).

**References:** [1] Klokočník J. et al. (2020), ISBN (10): 1-5275-4948-8; ISBN (13): 978-1-5275-4948-7. [2] Konopliv A. et al. (2020) *Geophys. Res. Letts*, 47.. doi: 10.1029/2020GL090568.

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