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Extremely fractionated martian crust

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The wave planetology states that two fundamental properties of celestial bodies determine their structure, namely, their movement and rotation. “Orbits make structures”. It means that: 1) Keplerian orbits with alternating body accelerations make them oscillate in form of standing waves; 2) rotation orders these oscillations in 4 directions an interference of which produces risen (+) and fallen (-) tectonic blocks; 3) rotation requires angular momenta of different level blocks to be equilibrated what means that their densities must differ; practically lowlands (-) are filled with denser material than highlands (+); 4) blocks “+” & “-“ have sizes corresponding to wavelengths: wave1 gives universal tectonic dichotomy, wave2 sectoring, other waves whose lengths are inversely proportional to orbital frequencies produce tectonic granulation. The higher hypsometric difference between tectonic blocks the higher must be their density difference. In the martian crust one observes very sharp dichotomy, sectoring and granulation. Sectoring (wave2) and granulation (also wave2 or πR) in martian case coincide and resonate (at Earth, for example, there is no strong resonance: sectoring πR, granulation πR/2). So, the martian orbital frequency twice as lower as the terrestrial one, is responsible for its very sharp relief that is height difference between tectonic blocks and hence for increased density difference between blocks. At Earth difference between compositions of ocean and continent is as between tholeiites and andesites. At Mars it must be greater: Fe-basalts of the northern lowlands must be opposed by much lighter rocks of the southern highlands like syenites, granites. Pathfinder has found andesites, THEMIS indicates dacites, Odyssey – low-Fe rocks, Spirit studying Columbia Hills-an outlier of highlands-found light alkaline rocks density of which is else diminished by an admixture of salts, hydrous salts. It is no surprise for us as such kind of lithology was predicted on basis of the wave planetology [1]. Mars-Express’s OMEGA results show on highlands along with salts basic rocks with olivine and pyroxene. There are two reasons of their presence: 1) extensive eolian contamination (that is why Mars is reddish); 2) possible presence of sills and dikes of basic rocks

intruding light highlands (as it is at Earth). MARSIS confirms wide development of water ice in the crust. Water facilitates fractionation processes leading to the sharp chemical dichotomy. References: [1] Kochemasov G.G. (2004) Mars and Earth: two dichotomies – one cause. In Workshop on “Hemispheres apart: the origin and modification of the martian crustal dichotomy”, LPI Contrib.#1203, LPI, Houston, p.37.