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Monitoring of natural viscous fluid rock (applicable for Mars and Venus)

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We need to know much more about climate and relationships with geological processes and structures. The global warming on Earth and its link to human activity is now considered firm, and may be important for geological. For understanding relationships between climatic and tectonic signals monitored displacements of markers in a salt glacier on Earth (Central Iran). Despite high reflectivity on the Mars images it is believed to represent surface salt (or ice cap) in the poles. Most of the salt on Mars interpreted as epsomite (NASA's Rover), but halite (and potash, gypsum and marl) are more exposed on diapirs and flats on Earth(e.g. Iran).The epsomite,Glauberite,thenardite sulfate salts and also gypsum are in similar properties to halite(hardness,SG,cleavage and solubility, viscosity)in Earth conditions. Nobody measure the rate of flow in epsomite on natural Earth. The structures similarities show that both chloride and sulfate salts are flowing probably similar ways. In the first documented staking exercise, hammered wooden stakes vertically through the surficial marl (c.10cm deep) onto the top of crystalline salt. These stakes installed in an irregular array elongate E-W along the c.50 m high cliff marking the effective SE terminus of the salt glacier at Qum Kuh(Central Iran) , just to the E of a NE trending river cliff about 40 m high. I merely measured the distances between pairs of stakes with known azimuth about 2 m apart to calculate sub horizontal strain in a small part of Qum Kuh. Every time used ice chest for tape to have constant length during measurements. Stakes moved and micro strains for up to 46 pairs of stakes was calculated for each seven stake epochs and plotted against their azimuth on simplified array maps. The data fit well the sine curves expected of the maximum and minimum strain ellipses. Short term micro strains of stake tie lines record anisotropic expansions due to heating and contraction due to cooling. In a daily measurement 2 stakes of the SE Mountain showed that, distances between stakes generally increased as the temperature rose and

decreased as the temperature fell. The horizontal distances between stakes generally expanded as the temperature rose and contracted as the temperature fell. The measurements show a positive relationship between temperature and salt expansion. However the cover can be contract on top of expanded salt, in conical shape topography. The seasonal measurements in the salt sheets suggest that the climate not only is important for daily cycle changes (elastic movements) but also is very important for the seasonal flow. The other measurements suggest that in the cold and rainy days the cover of the salt (mud and salt mixture) contracted to one third of the primary thickness .The expansion of salt in dry and hot days is 2to4 times upward .The rate of flow in the summer time was much more than winter (dry season) at Pohl (salt mountain Southern Iran-Zagros), but flow rates may change to more than a meter in a year in some of the salt sheets with high rate of rain falls show (e.g. Kuh-e-Namak Jahani and Ferooz abad in Zagros-Iran).The changes in the location of markers during different seasons acted as elastic flow sometimes. Another words the flow in salt sheets show forward and backward movements during hot and cold seasons respectively, but in the long period flow in the salt spreading sheet is forward. This means that the salt at Qum acted as plasto-elastic even in the longer periods. Polydimethylsiloxane (PDMS 36), a transparent Newtonian-viscous polymer with a density of 950 kgm-3 and a viscosity of 105 Pas was used to model salt flow (both chloride and sulfate salt). The analogue modeling on the PDMS sheets showed that rate of flow mainly affected by temperature changes. The flow in the sheet of PDMS under 78-80 degree C (temperature changed from 15-20 to 78-80) 8 times faster than a PDMS under room temperature (e.g. condition of salt on Venus planet).With increasing temperature rate of flow increased but with decreasing temperature in less than 3seconds the salt start to contract and moved backward, after 1 minutes salt start to spread forward. The flow amount (not rate) increased with increasing thickness of the PDMS sheet. The measurements suggest that the rate of flow in the surface salt of the Mars planet is much slower than Earth. In Laboratory freezing experiments of 22Œ20 mm droplets of brine (chloride and sulfate salt) in the temperature -11 to -22, the salt crystals generated as mixture crystals with ice in bottom of the droplets in the liquid state. The experiments show that 10 mil/l brine generated 1mil/l mixture of salt and ice after 180 minutes and 1.6 mil/l after540 minutes(on Earth gravity).The crystals compacted to 1.41.2mil/l after 1440 and1890 minutes in the Earth condition respectively(gravity 3 times more than mars). However NASA's Opportunity rover has demonstrated some rocks on Mars probably formed as deposits at the bottom of a body of gently flowing salt water. The existence of ice in the planet is uncertain, because of the high amount of salt. The wet salt can spread 3 times more during evaporations on Kavir (Central Iran) in the springs (20 degrees), and in the hot summer (50 to 60 degrees) the crystals of salt spread in the surface only one times more than primary state. However the shaping of spreading sheets and strain pattern of Mars' salt sheets are similar to Earth. The average temperature on Mars is about -55 C, Martian surface temperatures range widely from as little as -133 C at the winter pole to almost 27 C on the day side during summer (106 degrees different between summer and winter),and is enough for expansions and contractions of salt sheets. The structural geology of the folds of the white cap rock pole in the Mars suggests that the area may involve 7 to 11 times change in the loading time (or regional stresses).