



Habitability parameters determination on Mars surface with REMS (MSL metereological station).

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The next NASA mission to Mars is scheduled to be launch in the fall of 2011. Mars Science Laboratory (MSL) will study Mars surface habitability and possibilites of life on the red planet. Curiosity is the rover for the exploration of surface of Mars that will be carry on by MSL. Rover Environmental Monitoring Station, REMS, is an instrument that will fly to Mars as part of the payload of this rover. REMS is basically a meteorological station, composed of a suite of sensors aimed at measuring ground and air temperatures, wind speed and direction, pressure, humidity and ultraviolet radiation. Most of these sensors are accommodated on two booms, which are lo-cated on the rover mast at a height of approximately 1.5 meters. The ultraviolet and pressure sen-sor are located on the rover deck.

As part of putative science to be developed with the reported data from REMS we stablised sev-eral field campaigns for testing REMS methodology as pre mission training. We deployed in the field a metereological station and some REMS components and started to recor and analysed data. The Earth Analogues used for these experiences were Atacama and Chott El Jerid Deserts. Both of them are salty desert with salt deposites originated by sedimentation. These experiences were concived as Slow Motion Test.

Atacama Desert was choosed because is considered to be the driest place on Earth. As the driest place on Earth is a good candidate for this kind of experiences as Earth Analogue. This was the first place where "Habitability" studies with the metereological station in ther REMS context were developed.

Tunisia Chott El Jerid is also a salty desert with low water activity in salt depositis and high UV doses at the surface.

Habitability studies consisted on climate studies (UV radiation, atmosphere temperature, ground temperature at three different depths, wind direction) with data recorded along several days, as well as mineralogy and microbiology studies for determining presence of life under so harsh conditions. We tried to identify the main parameters influencing the presence and the diversity of life. Temperature modifications on ground surface or exothermic superficial processes probably drove by water deliquescence inside salt deposit were identified and recorded. Light attenuation events due to clouds or fog were also identified. Those modifications will be followed during Mars surface exploration by REMS in the framework of MSL mission. Others interesting results were also obtained as decreasing levels of life presence along the core profile.

References:

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