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The Role of the Photogeologic Mapping in the Morocco 2013 Mars Analog Field Simulation (Austrian Space Forum)

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The MARS2013 mission: The Austrian Space Forum together with multiple scientific partners will conduct a Mars analog field simulation. The project takes place between 1^{st} and 28^{th} of February 2013 in the northern Sahara near Erfoud. During the simulation a field crew (consisting of suited analog astronauts and a support team) will conduct several experiments while being managed by the Mission Support Center (MSC) located in Innsbruck, Austria. The aim of the project is to advance preparation of the future human Mars missions by testing: 1) the mission design with regard to operational and engineering challenges (e.g., how to work efficiently with introduced time delay in communication between field team and MSC), 2) scientific instruments (e.g., rovers) and 3) human performance in conditions analogous to those that will be encountered on Mars.

The Role of Geological Mapping: Remote Science Support team (RSS) is responsible for processing science data obtained in the field. The RSS is also in charge of preparing a set of maps to enable planning activities of the mission (including the development of traverses) [1, 2]. The usage of those maps will increase the time-cost efficiency of the entire mission.

The RSS team members do not have any prior knowledge about the area where the simulation is taking place and the analysis is fully based on remote sensing satellite data (Landsat, GoogleEarth) and a digital elevation model (ASTER GDEM)from the orbital data.

The maps design: The set of maps (covering area 5 km X 5 km centered on the Mission Base Camp) was designed to simplify the process of site selection for the daily traverse planning. Additionally, the maps will help to accommodate the need of the field crew for the increased autonomy in the decision making process, forced by the induced time delay between MSC and "Mars". The set of provided maps should allow the field team to orientate and navigate in the explored areas as well as make informed decisions about choosing the best alternative traverses if the ones suggested by the flight planning team based on satellite data turn out to be impossible. The set of maps includes:

1. A "geological map" prepared following suggestions of [3].
2. A set of experiment "suitability maps", one for every experiment, assessing the suitability of the area for an experiment. E.g., if a rover cannot move on surfaces that have an inclination larger than 5° and/or are covered with rocks larger than 15 cm in diameter, than the areas likely to have such conditions will be marked as not suitable for this experiment.
3. "Danger" map – showing locations of all potentially dangerous places e.g., cliffs.
4. "Mobility" map – with information important for estimating astronauts' mobility.

During the mission maps will be updated on a daily basis, based on the observations made in the field. In this way quality of the maps (and predictions based on them) will be gradually improved.

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