EXPLORATION ARCHITECTURE VALIDATION THROUGH ANALOGUE MISSIONS – A CANADIAN PERSPECTIVE. M-C. Williamson[1], V. Hipkin[1], M. Lebeuf[1], A. Berinstain [1], [1]Canadian Space Agency, 6767 Route de l'Aéroport, St-Hubert, QC, J3Y 8Y9, Canada. (Marie-Claude.Williamson@space.gc.ca)

Introduction: The value of activities carried out at planetary analogue sites in preparation for human and robotic exploration of the Moon and Mars has already been widely recognised [1-3]. While maintaining a specific science, test or training focus, analogue activities, through focused reporting, can be tuned to validate significant portions of exploration mission architectures. An *Analogue Mission* is defined as a fully integrated set of activities in support of, and/or simulating future exploration missions on the Moon or Mars. Concepts for an Analogue Mission Program are currently at the development stage at the Canadian Space Agency (CSA) and will directly build upon the successful Canadian Analogue Research Network (CARN) [1, 2]. The resulting databases and reports will contribute to the goals of Canada's new Space Exploration Program initiative and the international Global Exploration Strategy (GES). The overarching objective of Analogue Missions is to move forward *from concepts to results*, by building expertise, offsetting costs and risks, and providing valuable lessons learned, while achieving the next era of space exploration.

Analogue Missions: The CSA is currently developing a new *Analogue Mission Program* with the following short-term (1, 2) and long-term (3) objectives: (1) foster a multidisciplinary approach to planning, data acquisition, processing and interpretation, calibration of instruments, and telemetry during mission operations; (2) integrate new science with emerging technologies; (3) develop an expertise at CSA on exploration architecture design from projects carried out at terrestrial analogue sites in Canada [1]. Current ideas would solicit Analogue Mission proposals for traditional science, engineering, and/or human factor studies but give value to teams based on the strength of the included operations plan, and potential for operations innovation. Selected Analogue Mission teams would be required to develop planning tools, use mission-specific software and technology, and report results, detailed tactical operations, major decision points, and lessons learned during analogue surface operations. New databases as well as field reports would be compiled in an Experiment Operations Document. The resulting *Canadian Analogue Missions Directory* would eventually grow to contain information from many teams grouped according to mission objectives, type(s) of field deployments, etc. The expertise gained through the Program could inform all aspects of exploration architectures, including planetary mobility requirements and astronaut training. It is hoped that this Directory will be complementary to the planned NASA Analogs Database.

We present several examples of science, engineering, and human operations that could be carried out during Analogue Missions. The potential for international collaboration will also be discussed. The *Analogue Mission Program* activities will provide an opportunity for scientists, engineers, educators, and students to contribute to the design and planning of future exploration missions to the Moon and Mars. We expect the projected field deployments and on-site testing of new technologies in particular to foster a renewed interest in Space Exploration in Canada, and to promote collaboration with International Partners.

References:

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