Status of the correlation process of the V-HAB simulation with ground tests and ISS telemetry data

The Virtual Habitat (V-HAB) is a dynamic Life Support System (LSS) simulation, created to investigate future human spaceflight missions. V-HAB provides the capability to optimize LSS during early design phases. Furthermore, it allows simulation of worst case scenarios which cannot be tested in reality. In a nutshell, the tool allows the testing of LSS robustness by means of computer simulations. V-HAB is a modular simulation consisting of a:

1. Closed Environment Module

2. Crew Module

3. Biological Module

4. Physio-Chemical Module

The focus of the paper will be the correlation and validation of V-HAB against ground test and flight data. The ECLSS technologies (CDRA, CCAA, OGA, etc.) are correlated one by one against available ground test data, which is briefly described in this paper. The technology models in V-HAB are merged to simulate the ISS ECLSS. This simulation is correlated against telemetry data from the ISS, including the water recovery system and the air revitalization system. Finally, an analysis of the results is included in this paper.