Life Sciences as Related to Space (F)
Space Radiation Dosimetry in LEO and Beyond (F24)

DOSIMETRY AND VIBRATION MEASUREMENTS IN BIOLAB AND EMCS (DOS-VIBE)

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Space irradiation and vibrations in even small dosages can impact biological experiments and have not yet been measured in the biological payloads of the Columbus module at the International Space Station (ISS). Installing active dosimeters and accelerometers in the Experiment Containers (EC) of Biolab and the European Modular Cultivation System (EMCS), to survey in-situ the radiation and vibrations in these facilities, should be performed to serve as a reference of the space conditions to future experiments.

To monitor the radiation field, the space radiation should be measured with an active dosimeter inside the Multi-User-Facilities, as close to the actual shielding conditions of the biological experiments as possible. To measure the full spectrum of vibration frequencies, several instruments with different measurement ranges and sensitivity should be combined. The radiation and vibrations should be measured simultaneously in Biolab and EMCS to compare their radiation shielding and sensitivities to vibrations from the ISS. The radiation could also be measured with passive dosimeters. On the one hand this would be a back-up to the active dosimeter and on the other hand it would provide additional data since the passive dosimeters can give additional information on the radiation LET spectrum.
As a response to ESA’s Announcement of Opportunity (ILSRA-2009), a joint experiment in Biolab and EMCS, entitled Dos-ViBE, was proposed by the co-authors. The objectives and experimental flow of Dos-ViBE are outlined in this presentation.