

Life Sciences as Related to Space (F)

Space Radiation - Dosimetric Measurements and Related Models, Radiation Detector Developments and Ground-based Characterisation (F2.3)

Consider for oral presentation.

THE DOSIS AND DOSIS 3D PROJECT ON-BOARD THE INTERNATIONAL SPACE STATION – CURRENT STATUS AND SCIENCE OVERVIEW

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The radiation environment encountered in space differs in nature from that on earth, consisting mostly of high energetic ions from protons up to iron, resulting in radiation levels far exceeding the ones present on earth for occupational radiation workers. Accurate knowledge of the physical characteristics of the space radiation field in dependence on the solar activity, the orbital parameters and the different shielding configurations of the International Space Station (ISS) is therefore needed. For the investigation of the spatial and temporal distribution of the radiation field inside the European Columbus module the experiment “Dose Distribution Inside the ISS” (DOSIS), under the project and science lead of DLR, was launched on July 15th 2009 with STS-127 to the ISS. The DOSIS experiment consists of a combination of “Passive Detector Packages” (PDP) distributed at eleven locations inside Columbus for the measurement of the spatial variation of the radiation field and two active DOSTELs with a Data and Power Unit (DDPU) in a dedicated nomex pouch mounted at a fixed location beneath the EPM rack for the measurement of the temporal variation of the radiation field parameters. The DOSIS experiment suite measured during the lowest solar minimum conditions in the space age from July 2009 to June 2011. In July 2011 the active hardware was transferred to ground for refur-

bishment and preparation for the follow up DOSIS 3D experiment. The hardware for DOSIS 3D was launched with Soyuz 30S to the ISS on May 15th 2012. The PDPs are replaced with each even number Soyuz flight starting with Soyuz 30S and with each odd number Soyuz flight starting with Soyuz 45S. Data from the active detectors is transferred to ground via the EPM rack which is activated once a month for this action. The presentation will give an overview of the DOSIS and DOSIS 3D experiment and focus on the results from the passive radiation detectors from the DOSIS 3D experiment (2012 – 2015) in comparison to the data of the DOSIS experiment (2009 – 2011).