Life Sciences as Related to Space (F)
Space Radiation - Dosimetric Measurements and Related Models, Radiation Detector Developments and Ground-based Characterisation (F2.3)

# THE DOSIS AND DOSIS 3D EXPERIMENTS ON-BOARD THE INTERNATIONAL SPACE STATION – CURRENT STATUS AND LATEST DATA FROM THE DOSTELS AS ACTIVE INSTRUMENTS

Soenke Burmeister, burmeister@physik.uni-kiel.de
Christian-Albrechts-Universität zu Kiel, Kiel, Germany
Thomas Berger, thomas.berger@dlr.de
German Aerospace Center (DLR), Cologne, Germany
DOSIS3D
Bartos Przybyla, Daniel Matthiä, Günther Reitz German Aerospace Center (DLR), Cologne, Germany; Johannes Labrenz, Christian Albrechts Universität zu Kiel (CAU), Kiel, Germany; Pawel Bilski, Tomasz Horwacik, Anna Twardak, Institute of Nuclear Physics (IFJ), Krakow, Poland; Jozsef K. Palfalvi, Julianna Szabo, Andrea Stradi, MTA Centre for Energy Research, Budapest, Hungary, Budapest, Hungary; Iva Ambrozova, Nuclear Physics Institute (NPI), Prague, Czech Republic; Michael Hajek, International Atomic Energy Agency (IAEA), Vienna, Austria; Manfred Fugger, Lembit Sihver, Technical University Vienna (ATI), Vienna, Austria; Filip Vanhavere, Vanessa Cauwels, Werner Schoonjans, Alessio Parisi, Olivier Van Hoey, Belgian Nuclear Research Center (SCK-CEN), Mol, Belgium; Ramona Gaza, Lockheed Martin IS&GS, Space Radiation Analysis Group NASA Johnson Space Center, Houston, United States; Eduardo G. Yukihara, Eric R. Benton, Oklahoma State University (OSU), Stillwater, United States; Yukio Uchihori, Satoshi Kodaira, Hisashi Kitamura, National Institute of Radiological Sciences (NIRS) , Chiba, Japan; Matthias Boehme, OHB System AG - Bremen, Germany

Besides the effects of the microgravity environment, and the psychological and psychosocial problems encountered in confined spaces, radiation is the main health detriment for long duration human space missions. 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 encountered 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 DOSIS (Dose Distribution Inside the ISS) under the lead of DLR has been launched on July 15th 2009 with STS-127 to the ISS. The experimental package was transferred from the Space Shuttle into COLUMBUS on July 18th. It consists of a combination of passive detector packages (PDP) distributed at 11 locations inside the European Columbus Laboratory and two

active radiation detectors (Dosimetry Telescopes = DOSTELs) with a DDPU (DOSTEL Data and Power Unit) in a Nomex pouch (DOSIS MAIN BOX) mounted at a fixed location beneath the European Physiology Module rack (EPM) inside COLUMBUS. The active components of the DOSIS experiment were operational from July 18th 2009 to June 16th 2011. After refurbishment the hardware has been reactivated on May 15th 2012 as active part of the DOSIS 3D experiment and provides continuous data since this activation. The presentation will focus on the latest results from the two DOSTEL instruments as absorbed dose, dose equivalent and the related LET spectra gathered within the DOSIS (2009 - 2011) and DOSIS 3D (since 2012) experiment. The CAU contributions to DOSIS and DOSIS 3D are financially supported by BMWi under Grants 50WB0826, 50WB1026, 50WB1232 and 50WB1533.