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DOSIS & DOSIS 3D onboard the ISS – Status and Science Overview from 2009 - 2018

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The radiation environment encountered in space differs in nature from that on Earth, consisting mostly of highly energetic ions from protons up to iron, resulting in radiation levels far exceeding the ones present on Earth for occupational radiation workers. Since the beginning of the space era the radiation exposure during space missions has been monitored with various passive and active radiation instruments. Also on-board the International Space Station (ISS) a number of area monitoring devices provide data related to the spatial and temporal variation of the radiation field in – and outside the ISS. The aim of the DOSIS (2009 – 2011) and DOSIS 3D (2012 - ongoing) experiment is the measurement of the radiation environment within the European Columbus Laboratory of the ISS. These measurements are, on the one hand, performed with passive radiation detectors mounted at eleven locations within Columbus for the determination of the spatial distribution of the radiation field parameters and, on the other hand, with two active radiation detectors (DOSTEL) mounted at a fixed position inside Columbus for the determination of the temporal variation of the radiation field parameters. The talk will give an overview of the current results of the data evaluation performed for the passive and active radiation detectors for DOSIS & DOSIS 3D in the years 2009 to 2018. Further on we will describe current ongoing work in terms of data comparison with the ALTEA, the DB-8, the ISS-RAD, the TRITEL and the R3DR2 instruments located at various positions in – and outside the ISS and provide current status of GEANT4 simulation results for the radiation environment inside the ISS.

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