

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Radiation Fields, Effects and Risks in Human Space Missions (4)

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THE COCORAD BALLOON-BORNE COSMIC RADIATION AND DOSIMETRY MEASUREMENTS
IN THE FRAME OF THE BEXUS PROGRAMME

Abstract

Due to significant spatial and temporal changes in the cosmic radiation field, radiation measurements with advanced dosimetric instruments on board spacecrafts, aircrafts and balloons are very important. The Hungarian CoCoRAD Team was selected to take part in the BEXUS (Balloon Experiment for University Students) project. In the frame of the BEXUS programme Hungarian students from the Budapest University of Technology and Economics carried out scientific experiments on a research balloon, which was launched from Northern Sweden in September 2011. The main objective of the Combined TriTel/Pille Cosmic Radiation and Dosimetric Measurements (CoCoRAD) is to measure the effects of the cosmic radiation at lower altitudes where measurements with orbiting spacecrafts are not possible due to the strong atmospheric drag. By evaluating the deposited energy spectra recorded by TriTel and the glow curve obtained after the on-ground read-out of the retrieved Pille dosimeters, the Linear Energy Transfer spectra, the average quality factor of the cosmic radiation as well as the absorbed dose and the dose equivalent can be determined. The doses measured with the Pille thermoluminescent dosimeters and the TriTel 3D silicon detector telescope were intercompared for the first time. Based on the CoCoRAD results estimation can be also given for the doses that might be expected during launch of manned space flights or even commercial air flights. This paper will present the main objectives of the CoCoRAD experiment, the radiation environment in the altitude range of the BEXUS balloon, and the results of the CoCoRAD experiment.