

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Space Vehicles – Mechanical/Thermal/Fluidic Systems (7)

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THE HUNGARIAN COCORAD EXPERIMENT IN THE BEXUS PROGRAM OF THE ESA

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) 1213 project. In the frame of the BEXUS programme Hungarian students from the Budapest University of Technology and Economics carried out a radiation and dosimetric experiment on a research balloon, which was launched from Northern Sweden in September 2011. The central part of the experiment was the TriTel 3-dimensional silicon detector telescope which was originally developed for cosmic radiation and dosimetric measurements on board the International Space Station. In the frame of the CoCoRAD experiment the TriTel were modified and extended with additional mechanical, thermal and electrical parts to make it able for operating on board the BEXUS stratospheric balloon system. During the development process the relatively hard environmental conditions were taken into account, like the very high accelerations during the flight profile of the balloon, the very low outside temperatures in the stratosphere (can be -90C) and the electrical interface requirements between the experiment and the BEXUS balloon own communication system. This paper presents the brief overview of the CoCoRAD experiment objectives, the description of the used mechanical protection against the high accelerations, the applied thermal model for the experiment and its verification results from the flight of the BEXUS-12.