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Utilization of Passive Detector's Technologies for the "PHOENIX" Experiment on Board the International Space Station in 2014-2016

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*The Russian long-term **'PHOENIX'** Space Experiment* started in November 2014 with the purpose of investigating the impact of space radiation on genetic properties and survival of biological samples exposed on-board the **International Space Station**. Such projects require detailed knowledge on the composition, fluxes and doses of various components of cosmic radiation. To solve this problem it is convenient to use passive detector's that have a number of advantages: they are cheap, compact, does not consume electric power, maintenance-free during exposure and allows to evaluate large number of physical quantities.

In the first two-year phase of the on-going **Project** LET spectra, absorbed dose and dose equivalent rates are measured in the direct vicinity of the samples in three different modules of the *Russian segment* by applying sets of passive detector packages. The sets of space radiation detectors comprising of *Thermo-luminescent Dosimeters* made of LiF:Mg,Ti (MTS-6, MTS-7, DTG-4) materials and *Solid State Nuclear Track Detectors* made of PADC (polyallyl-diglycol-carbonate) are recovered in 4 consecutive sessions after **0.5**, **1**, **1.5** and **2** year exposure. The contribution of secondary neutrons and heavy nuclear fragments to the total space radiation doses is also assessed with the use of an extensive analysis. The space radiation data acquired in the experiment allowed observing the dose variations on the decline of the 24th Solar Cycle.

Averaged measurements from the first session (Nov 2014 - Jun 2015) resulted in more than **2.5** times higher total dose rate in the *Pirs* docking module than in the *Service* module. This difference might be explained by the much weaker shielding of the *Pirs* module, thus the greater contribution of high-LET components to the dose rate and the easier penetration of low-LET particles.

This report presents detailed analysis of space radiation data obtained with passive detectors during the 1st Phase of the **Project** in 2014-2016 by Russian and Hungarian research groups.

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