

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

Author: Dr. Attila Hirn

MTA Centre for Energy Research, Hungary, hirn.attila@energia.mta.hu

Mr. Istvan Apathy

KFKI Atomic Energy Research Institute, Hungary, apathy@sunserv.kfki.hu

Dr. Yuri A. Akatov

Institute for Biomedical Problems, Russian Federation, akatov@pike.net.ru

Mr. Valery Arkhangelsky

NPO Energomash, Russian Federation, energo@online.ru

Mr. Laszlo Bodnar

BL-Electronics, Hungary, bodnarl@bl-electronics.hu

Dr. Sándor Deme

KFKI Atomic Energy Research Institute, Hungarian Academy of Sciences, Hungary, deme@sunserv.kfki.hu

Dr. Tamás Pázmándi

KFKI Atomic Energy Research Institute, Hungarian Academy of Sciences, Hungary,

pazmandi@aeki.kfki.hu

Mr. Szanto Peter

Centre for Energy Research, Hungarian Academy of Sciences, Hungary, szanto.peter@energia.kfki.hu

TL DOSE MEASUREMENTS ON BOARD THE RUSSIAN SEGMENT OF THE ISS BY THE “PILLE”
SYSTEM DURING EXPEDITION-15 AND -16

Abstract

The most advanced version of a thermoluminescent (TL) dosimeter system (“Pille-MKS”) consisting of ten CaSO₄:Dy bulb dosimeters and a compact reader, developed by the KFKI Atomic Energy Research Institute of the Hungarian Academy of Sciences (MTA KFKI AEKI) and BL Electronics for application in space is continuously in use on board the ISS since October, 2003. The Pille-MKS dosimeter system is applied for the routine and EVA individual dosimetry of astronauts as part of the service system as well as for onboard experiments and operated by the Institute for Biomedical Problems (IBMP). It is unique providing accurate and high resolution TL dose data already on board the space station. Seven dosimeters are located at several places of the Russian segment of the ISS and read out once a month, two dosimeters are dedicated for EVAs and one dosimeter is kept in the reader and read out automatically every 90 minutes providing high resolution in time dose measurements. During particular events like coronal mass ejections, hitting Earth incidental measuring campaigns are intercalated with frequent readouts. Furthermore, Pille dosimeters were used occasionally for additional onboard measurements as well. In this paper we report results of dosimetric measurements made aboard the International Space Station during Expedition-15 and -16 using the “Pille” portable TLD system and compare them with our previous measurements on the ISS and previous space stations.