Space Plasmas in the Solar System, including Planetary Magnetospheres (D)
Galactic Cosmic Rays and their Anti-particles (D1.2)

TEMPERATURE EFFECT CORRECTION ON THE COSMIC RAY (MUON) DATA OBSERVED AT THE BRAZILIAN SOUTHERN SPACE OBSERVATORY IN SAO MARTINHO DA SERRA

Carlos Roberto Braga, crbraga@dge.inpe.br
National Institute for Space Research (Brazil), Sao Jose Dos Campos, Brazil
Alisson Dal Lago, dallago@dge.inpe.br
National Institute for Space Research (Brazil), Sao Jose Dos Campos - SP, Brazil
Takao Kuwabara, takao@bartol.udel.edu
University of Delaware, Newark, Delaware, United States
Nelson Jorge Schuch, njschuch@lacesm.ufsm.br
Southern Regional Space Research Center - CRS/CCR/INPE - MCTI, Santa Maria - RS, Brazil
Kazuoki Munakata, kmuna00@shinshu-u.ac.jp
Shinshu University, Matsumoto, Japan

The negative atmospheric temperature effect observed on the muon intensity measured by surface-level detectors is related to the atmospheric expansion during summer periods. According the first explanation given, the path of muons from the higher atmospheric level (where they are generated) to the ground becomes longer, and more muons decay, leading to a muon intensity decrease. A significant negative correlation, therefore, is expected between the altitude of the equi-pressure surface and the muon intensity. We compared measurements of the altitude of 100 hPa equi-pressure surface and data from the multidirectional muon detector installed at the Brazilian Southern Space Observatory in Sao Martinho da Serra, RS. Significant correlation coefficient were found (up to 0.95) when using data observed in 2008. For comparison, data from the multidirectional muon detector of Nagoya, located in the opposite hemisphere, is studied and an anti-phase in the cosmic ray variation related with the temperature effect is expected between data from detectors of Nagoya and Sao Martinho da Serra. The temperature influence is higher for the directional channels of Nagoya than for ones of Sao Martinho da Serra. Also, the corrected and un-corrected data are compared.