[EE] Evening Poster | P (Space and Planetary Sciences) | P-EM Solar-Terrestrial Sciences, Space Electromagnetism & Space Environment

[P-EM12]Space Weather, Space Climate, and VarSITI

convener:Ryuho Kataoka(National Institute of Polar Research), Antti A Pulkkinen (NASA Goddard Space Flight Center), Kanya Kusano(名古屋大学宇宙地球環境研究所, 共同), Kazuo Shiokawa(Institute for Space-Earth Environmental Research, Nagoya University)

Thu. May 24, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Past, Present, and Future of Solar-Terrestrial Environment is the keynote of this session. We share the latest scientific papers to understand how the solar-terrestrial environment changes in various time scales, and discuss the necessary international collaboration projects associated with VarSITI. More specifically, welcomed papers include space climate studies using tree rings and ice cores; cutting-edge observational and modeling studies of geospace, heliosphere and the sun; simulation and statistical studies to predict the future space weather and space climate.

[PEM12-P16]Muon flux measurements during the 2017 total solar eclipse

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Keywords:space weather, cosmic rays, solar eclipse

Cosmic rays are high energetic particles impacting upon the Earth’s atmosphere leaving trails of fundamental particles such as pions, kaons, and muons, which decay into additional particles through cascade processes. These cosmic rays originate mainly from sources outside our solar system but a small fraction originate in the Sun. The objective of this experiment was to determine whether the incidence of secondary cosmic rays fluctuated during the 2017 total solar eclipse, with the hypothesis that the part of the atmosphere directly in the shadow of the Moon would contain fewer muons. As part of the experiment, a muon detector was deployed near the centre of totality in Wyoming, USA. The data acquisition was performed over several hours to establish baselines before and after the eclipse. When a muon enters the detector, it loses some of its kinetic energy, which is then transferred into the atoms of a fluorescent emitter leading to light emission detectable by photomultiplying tubes. In this presentation, we detail the physics behind secondary cosmic rays, the detection unit, and the space weather impact of the 2017 solar eclipse on cosmic rays reaching the Earth’s surface.