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Room:203

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Simulation of Air Shower Induced by Solar Energetic Particle

Tatsuhiko Sato^{1*}, Hiroshi Yasuda², Ryuhō Kataoka³, Seiji Yashiro⁴, Takao Kuwabara⁵, Daikou Shiota⁶

¹JAEA, ²NIRS, ³Tokyo Tech, ⁴CUA, ⁵University of Delaware, ⁶RIKEN

When solar energetic particles (SEP) or galactic cosmic-rays (GCR) are incident to the atmosphere, they can induce air showers by generating varieties of secondary particles. Such secondary particles can reach conventional flight altitudes (~12 km), and hence, aircrews are exposed to enhanced level of radiations. In order to precisely estimate the aircrew doses, the Monte Carlo simulation for air shower is indispensable. We had therefore simulated air showers induced by GCR, using a general-purpose Monte Carlo particle and heavy ion transport simulation code system PHITS, and established a model for calculating the aircrew doses anywhere in the world at the solar quiet time [Sato et al. Radiat. Res. 2008, <http://phits.jaea.go.jp/expacs/>]. In this study, we applied our simulation technique to the analysis of air shower induced by SEP, and established a model for estimating the aircrew doses from a given SEP energy spectrum and cutoff latitude. The model is to be incorporated into our developing Warning System of AVIation Exposure to SEP called WASAVIES. The procedures for the air shower simulation together with some initial results of the aircrew dose calculations for past GLE events will be presented at the meeting.

Keywords: SEP, air shower, radiation dose, Monte Carlo simulation, GLE, WASAVIES