

Modeling of the 22-year variation in the solar modulation of galactic cosmic rays

Shoko Miyake¹, Ryuho Kataoka² and Tatsuhiko Sato³

¹*National Institute of Technology, Ibaraki College*

²*National Institute of Polar Research*

³*Japan Atomic Energy Agency*

The variation of galactic cosmic rays intensity caused by the solar-terrestrial environmental changes is known as the solar modulation of galactic cosmic rays (GCRs). We have developed the time-dependent and three-dimensional code for the solar modulation of GCRs. This code is based on the stochastic numerical method assuming the realistic physical processes such as the diffusion, convection, adiabatic energy losses, and drift motion. By assuming the variation of the solar wind velocity, the strength of the interplanetary magnetic field, and its tilt angle, we can calculate the 22-year variation in the solar modulation of GCRs. In this presentation, we report the results of the solar modulation of GCRs during the solar cycle 22/23, 23/24, and 24/25. We also report the neutron monitor counting rate and the radiation dose at an aircraft altitude calculated from these results.