



## The origin of solar diurnal variation of galactic cosmic rays above 100 GV

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**Abstract:** Recent observations of the Matsushiro deep underground muon telescope indicate that the solar diurnal variation (after correcting for the Compton-Getting anisotropy due to the Earth's orbital motion) has a significant solar cycle variation and a 0.04% daily wave extends to rigidities as high as several hundreds of GV during solar maximum. We construct a simple model to simulate the motion of high-rigidity particles in the heliosphere assuming different heliospheric current sheet (HCS) configurations. An ensemble of particle trajectories are traced back from Earth to the heliopause. The model includes regular motion as well as scattering due to magnetic field irregularities. We find that a highly tilted and warped sheet may result in an anisotropy, comparable to that observed at Matsushiro around 600GV. The variation of the predicted amplitude and phase is compared with the observed ones. The implications of the anisotropies will be discussed.