

A Development of high energy particle detectors for future space missions

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We are developing a medium energy particle detector in a high-count rate environment, in order to solve the acceleration mechanism and the process of high-energy particles in the collision less plasma shock region in the space. The key observation is to measure the maximum energy of accelerated particles correctly. It is important to reduce the pile-up events, in order to measure the correct maximum energy. The new developed detector for the high-count rate environment consists of the Double-sided Silicon Strip Detector (DSSD) and the readout LSI chips VA32TA, made by IDEA. The performance of the new DSSD system for charged particles was tested using proton beams with an energy of 6 MeV from the medium-energy accelerator in HIMAC of the National Institute for Radiological Science. The result is that the new DSSD system works well and has high performance in detecting not only x-rays, but also charged particles. It is certain that this new DSSD system can measure the correct energy of incident particles in high-count rate environments using the accelerator.