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Performance test of the Multi-gap Resistive Plate Chamber (MRPC) with cosmic ray MICHIIHIKO IKEDA, TOMOMI AKIEDA, SHOKO TOMITA, AKI NINOMIYA, Department of Physics, Tohoku University — MRPC is a gaseous ionization detector, which a good timing resolution has been used practically in the nuclear and particle physics experiment. A mixed gas of SF₆ and Fleon 134a was flowed through the gaps between high resistive plates (500 μ m thickness glass). A high electric field of $\sim 2 \times 10^6$ [V/m] was applied between the plates. A charged particle passes through the MRPC and causes avalanche amplification. We constructed a relatively small MRPC with a readout pad (20 mm \times 50 mm). The development is motivated by feasibility study of the MRPC as a photon tagger at the Research Center for Electron Photon Science (ELPH), Tohoku University. The photon tagger needs a good timing resolution (< 100 ps), therefore we studied the small size MRPC, while a large sized MRPCs are widely used in nuclear and particle experiments. The MRPC can operate under the strong magnetic field and thus it can be a good candidate as an electron detector placed in the magnet. We tested the HV dependence of time resolution of the MRPC with cosmic rays. The MRPC will be demonstrated at the open campus of the Tohoku University as an example of nuclear experimental detectors. We will measure the zenith angle and velocity distributions of cosmic ray.

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