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Measurement of zenith angle distribution of cosmic rays by a spark chamber YUICHI TOYAMA, YU OGURA, HIROSHI KON, TIANWEI WANG, KUNIHIKO HASEGAWA, Department of Physics, Tohoku University — Spark chamber is a detector which developed by Fukui and Miyamoto in 1959. It visualizes tracks of charged particles. It consists of many layers of the acrylic frames with electrode plates at the top and bottom, where high voltage (6-7 kV) was put. The chamber was filled with inert gas such as helium. A spark along the trajectory of a charged particle by high voltage can be seen when internal gas is ionized by the charged particles. The chamber was designed and constructed by ourselves. Materials and gap of the electrodes were optimized and stainless steel with 1.5 cm gap were chosen. Plastic scintillation counters were placed up and down of the chamber and the signals from them were used as the trigger. The voltage to the electrode plates is applied only when the cosmic rays pass through the scintillators. The spark chamber will be demonstrated as the nuclear and particle physics experiment detector to high-school students at the open campus of our university. Furthermore, the zenith angle distribution of cosmic rays will be measured by the spark chamber. Image analysis method will be used for this measurement.

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