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Development of a GEM-TPC for H-dibaryon Search Experiment at J-PARC

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A TPC has been developed for J-PARC E42 experiment to search for H-dibaryon in (K-, K+) reaction. An event with 2 pi- and 2 protons decaying from H-dibaryon is searched for inside the TPC. The TPC has octagonal prism shape drift volume with about 50 cm diameter with 55 cm drift length filled with Ar-CH4 (90:10) gas. At the end of the drift volume, 3-layer GEMs are equipped. In order to analyze momenta of produced particles, the TPC is applied with 1 T dipole magnetic field parallel to the drift electric field with a uperconducting Helmholz magnet. In order to maximize the acceptance of H-dibaryon events, a diamond target is installed inside the TPC drift volume, in a cylindrical hole opened from the top to the middle of the drift volume. Since extremely high-rate K- beam is directly injected into the TPC drift volume to the target, a gating grid and GEMs are adopted to suppress positive-ion feedback. We present design and status of R&D. We show performance of prototype with high-intensity beams at RCNP (Research Center for Nuclear Physics) at University of Osaka, and with a UV laser under magnetic field at J-PARC.

Presenter:SAKO, Hiroyuki (Japan Atomic Research Agency)Session Classification:Monday (MPGD afternoon session)