

Pilot production of RPCs for the SHiP experiment

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Two main aims of the SHiP (Search for Hidden Particles) experiment are the observation of hidden particles and high-statistics study of tau neutrino events. These particles can be produced from the decay of charmed particles in the SHiP hybrid target which is composed of a totally 58-cm long series of TZM slabs followed by Tungsten slabs of the same total length. A major concern for the experimental design is the precise knowledge of the muon flux and the associated charm production cross section. To achieve the physics goals, we plan to carry out a test experiment with SHiP target replica using CERN SPS 400 GeV/c proton beam at H4 area in July 2018. In this test experiment, RPCs will be used for muon identification and their slope measurements. Recently, we have fabricated gas gaps and strip panels to build 6 trigger RPC modules. The module is composed of a 2-mm gas gap and two orthogonal strips of a 10.625-mm pitch. In addition, we constructed a small prototype RPC of a size of 100 x 130cm² with the same strip pitch to study the fundamental detector performance using cosmic rays. The current construction of the RPC modules is also as a pilot production for the future SHiP experiment in synergy with the present RPC production for the CMS experiment. In the presentation, we report the design of the RPCs for the test experiment and cosmic-ray test results for the small prototype RPC.

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