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Development of Hybrid Resistive Plate Chambers

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Among the several outstanding issues associated with the RPCs, the loss of efficiency for the detection of particles when subjected to high particle fluxes, and the limitations associated with the common RPC gases can be listed. In order to address the latter issue, we developed novel RPC designs with special anode planes coated with high secondary electron emission yield material such as Al_2O_3 and TiO_2 . The proof of principle was obtained for various designs and is in progress for the rest. The idea was initiated following the achievements on the development of the novel 1-glass RPCs.

Here we report on the construction of various different RPC designs, and their performance measurements in laboratory tests and with particle beams; and discuss the future test plans which include the long term performance tests of the newly developed RPCs, investigation of minimal gas flow chambers, and the feasibility study for the large size chambers.

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