

MRPC with eco-friendly gas

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The Multi-gap Resistive Plate Chambers(MRPC) are used as a timing device in several collider experiments and a cosmic ray experiment. The MRPC is a gaseous detector and operates essentially with a mixture of gases. The gas mixture of MRPC at current experiments is based on the greenhouse gases (GHG) such as freon of Hydro-Fluoro-Carbon (HFC) group. The studies to reduce the amount of emission of the warming gas in high energy experiments are underway, and the present contribution has been performed as part of this effort. The results have been obtained from the beam test of a small MRPC which has 6 gaps of 220 μm and an efficient area of 20cm \times 20cm. It has been operated with the ecological HFO-1234ze gas, and with the conventional freon-based gas mixture as well. We have found that the eco-gas can substitute for the freon-based gas mixture without significantly compromising the current level of performance.

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