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Resistive microstrip and microdot detectors: a novel approach in developing spark protected micropattern detectors

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A new family of spark-protected micropattern gaseous detectors is introduced: a 2-D resistive microstrip and microdot counters, and hybrid configurations, which combine in one design a resistive GEM with a microstrip/microdot detector. These novel detectors have several important advantages over the conventional micropattern detectors including GEM and MICROMEGAS. For example they feature higher values of the maximum gas gains, a simpler design containing at the same time less components, a simpler production technique and cost effectiveness. Our studies have revealed many interesting features of such detectors, for example in some gas mixtures the microdot detector can operate in self quenched streamer mode and at higher voltages in streamer mode similarly to RPCs. These resistive microstrip/microdot detectors can be used in many applications. As an example, we will describe successful tests of prototypes oriented to the RICH application (for the ALICE RICH upgrade) and for noble liquid dual phase TPCs.

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