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Development of a thermal bonding technique for Micromegas fabrication

The micro-mesh gaseous structure (Micromegas) have been significantly developed during the decades since that it was proposed in 1995 at Saclay. Some new methods, like the thermal bonding technique which is much different from standard “bulk” etching technique are under R&D. In this paper, the manufacture processing of this new thermal bonding technique and its advantages, deficiencies will be discussed at first. In order to reduce the sparking rate, the resistant anodes by Germanium plating and carbon paste screen printing are studied. High absolute gas gain above 10000 which is much higher than 2000-4000 of standard chambers and a good resolution of 16% (FWHM) for 5.9 KeV x-rays are obtained. Some interesting applications of this technique, such as, development of a 2D position-sensitive Micromegas detector with four-corner readout, the back-to-back double avalanche structure, etc. will also be presented.

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