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A successful application of thinner-THGEMs

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The thinner-THGEMs (Thick Gas Electron Multipliers), typically with 0.2mm thickness, 0.2mm hole diameter, 0.7mm pitch and a narrow (5˜20μm) rim, represent a promising option for a parallax-free curved gas detector with relative high spatial resolution and large dynamic range of gain. In this paper we report the study of thinner-THGEMs that have been developed by UCAS (university of Chinese Academy of Sciences). The performance was monitored for over 3 months using Cu X-ray tube. In general, a gain of 1X104 was obtained with only a single board in Ar/iC4H10 (97:3). The dependence of gain on the pressure and temperature was measured and it shows a ˜12% gain drop with a 5 degree temperature increase at 1 atm. The performance of prototype working under high counting rate is also studied. Based on the previous studies, a curved thinner-THGEM chamber with a 48 degree acceptance and 0.2°angle resolution at 20cm radius has been developed for diffraction studies at Beijing Synch! rotron Radiation Facility (BSRF). The result shows a 0.14°angle resolution can be achieved with current data acquisition mode.

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