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Development of μ-PIC with resistive electrodes using sputtered carbon

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Micro-Pixel chamber (μ-PIC) with resistive electrodes has been developed for particle tracking detector in the environment of high rate HIP (Highly Ionizing Particles). One of the target of this development is ATLAS Muon Tagger that is considered to be disposed at phase-2 upgrade. The amplification region of μ-PIC is separated by isolated pixels, so it is expected to separate multi incident tracks with high position resolution. In our previous research resistive μ-PIC has succeeded to get enough gain for observing minimum ionizing particles and to suppress the sparks. As new developments, sputtered carbon is used as resistive cathode strips which are arranged by 400μm pitch with 250μm diameter hole. Very fine pattern can be formed with lift off process and resistivity is well controlled by varying its thickness (50-500nm) and nitrogen doping. Physical and chemical toughness of the resistive electrodes are realized by its diamond-like carbon structure. The gain measurement and spark tolerant test by fast neutron irradiation will be reported.

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