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Development of Capacitve Coupled LGAD detector (AC-LGAD) in US and Japan

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Particle detectors at future lepton or hadron colliders will require covering a very large area with a tracker with fine spatial resolution of O(10)um. A timing capability of O(10)ps in addition should improve the tracking reconstruction, particle identification of charged particles and mass measurement of newly discovered particle. Capacitive-coupled Low-Gain Avalanche Diode (AC-LGAD) is a semiconductor tracking detector with precise timing resolution and spatial resolution developed by KEK and Tsukuba group collaborating with Hamamatsu Photonics K.K. (HPK). A 100um x 100um pitch pixel type sensor and 80um pitch with 10mm length strip type sensor with 20-50um active thickness have been successfully developed with fully uniform gain across sensor active area. In this presentation we will present about recent status of the development of AC-LGAD detector and possibility of improvement for timing resolution and radiation tolerance.

Type of presentation (scientific results or project proposal)

Type of presentation (in-person/online)

Presenter: NAKAMURA, Koji (High Energy Accelerator Research Organization (JP))

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