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## Development of AC-LGAD Detectors for Electron-Ion Collider

*Wednesday 8 October 2025 15:20 (20 minutes)*

The Electron-Ion Collider (EIC) is a next-generation flagship facility being constructed at Brookhaven National Laboratory to explore the properties of nuclear matter and the strong interaction via electron-proton and electron-ion collisions. In this talk, we will present the latest designs of Time-of-Flight detector systems based on the silicon AC-coupled Low Gain Avalanche Diode (AC-LGAD) technology. Featuring a built-in gain layer and a uniform resistive layer with AC-coupled electrodes, this technology enables simultaneous precision timing ( $\sim 20\text{--}35$  ps) and spatial ( $\sim 20\text{--}30\mu\text{m}$ ) measurements of charged particles. Results from the latest test beam campaigns on detector prototypes, the performance and readiness will be discussed.

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