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G4beamline simulation for rotating telescope at SLRI BTF

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ALICE (A Large Ion Collider Experiment) is one of the CERN experiments along LHC that studies quark-gluon plasma, a state of matter thought to have formed shortly after the big bang. By 2021, a plan to upgrade the ALICE Inner Tracking System has been proposed and the Monolithic Active Pixel Sensor, a novel silicon sensor technology, will be employed. The ALICE PIxel DEtector is the name of the new sensor (ALPIDE). The ALPIDE sensor is planned to be investigated with a rotating telescope at the Synchrotron Light Research Institute Beam Test Facility using a 1.2 GeV electron beam. A part of this work is to study the pixel sensor telescope when the angle of the Device Under Test (DUT) plane changes. Simulation has been performed with the G4beamline software. Once the G4beamline simulation is completed, a ROOT file is produced. The beam profile and correlation plot are then analyzed. These data were used to calculate the scattering angle, which was found to be between 0.0098 and 0.0102 rad when a DUT was not rotated. Furthermore, the simulation result was compared to the theoretical calculation.

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