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Presentation

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Proton Track reconstruction in a Telescope for Proton Computed Tomography

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Proton computed tomography (pCT) is a medical scanning technology suitable for treatment planning of proton therapy. Suranaree University of Technology, together with the Bergen pCT collaboration, is currently constructing a pCT prototype for clinical trials. This study aims to reconstruct proton tracks generated from a Monte Carlo simulation which can be applied to 3-dimensional image reconstruction. Our simulation is built on Geant4 via Gate toolkits. We analyze a simultaneous irradiation of the telescope with the KCMH proton beam implementing a track following algorithm written in python. Hereby, each node or hit point will identify its subsequent node within the next detector layer as the one within minimum distance. We fix the ratio of the number of reconstructed track hits to Monte Carlo hits at 75%. The pencil beam at 220MeV has 3.3 mm of spot sigma. With 200 primary protons in simulation, the reconstruction efficiency can achieve 84%.

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