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MONDO Neutron Tracker Characterisation by Means of Proton Therapeutical Beams and MonteCarlo Simulation Studies

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Abstract : The MONDO (MOnitor for Neutron Dose in hadrOntherapy) project aims a precise characterisation of the secondary fast and ultrafast neutrons produced in particle therapy treatments. The detector is composed of a matrix of scintillating fibres (250 um) readout by CMOS Digital-SPAD based sensors. Recoil protons from n-p elastic scattering are detected and used to track neutrons. A prototype was tested with proton beams (Trento Proton Therapy Centre): efficiency, light yield, and track-reconstruction capability were studied. The results of a MonteCarlo FLUKA simulation used to evaluated double scattering efficiency and expected backgrounds will be presented.

Keywords : secondary neutrons, particle therapy, tracking, elastic scattering
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