

Workshop on Advanced Radiation Detector and Instrumentation in Nuclear and Particle Physics (Online)



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Detectors for light charged particles, neutrons and fission fragments produced in low energy nuclear physics experiments

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To understand the strong force that binds all the nucleons together, it is required to perform collision experiments using particle accelerators and detect the reaction products starting from light nuclei like neutron, proton, alpha etc. to very heavy nuclei like fission fragments and evaporation residues. At BARC-TIFR Pelletron-Linac facility, Mumbai, several detector arrays have been setup which are used for the above purposes. For example, the light charged particles are detected using an array of telescopes made of position sensitive silicon strip detectors [1] and many times with small silicon surface barrier detectors, whereas neutrons and gammas are detected using the arrays of plastic and liquid scintillators [2]. On the other hand, heavy nuclei like fission fragments are detected using position sensitive Multiwire Proportional Counters (MWPC) developed in-house [3]. For detecting fission fragments with better timing resolution the micro channel plate (MCP) based detectors for are also being developed at BARC. The details of the characterizations and performances of the above detectors will be presented.

[1] D. Chattopadhyay et. al. Phys. Rev. C 94, 061602(R) (2016)

[2] P.C. Rout et al. JINST 13, P01027 (2018)

[3] A. Pal et al. JINST 15, P02008 (2020)

What is your experiment?

Experiment using heavy ion accelerator facility

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