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Novel detector systems for decay spectroscopy at FAIR/NUSTAR

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Recently, the combination of the highly pixelated active DSSSD AIDA implanter and the compact, high-efficiency Ge array DEGAS-I has been commissioned and employed for first successful NUSTAR experiments at FAIR Phase-0. Based on the experience gained, a novel type of implanter, FIMP, aiming for highest efficiency, low-noise and ultimate timing characteristics is under development. For the first time, FIMP will be employing scintillating fibres. It will perfectly match to the future variants of the gamma array DEGAS-II and DEGAS-III. The latter one planned to be the first imaging grade gamma spectrometer, enabling the event-by-event distinction of gamma quanta emitted from the implantation zone versus quanta originating from the strong environmental background. The sensitivity gain of this set-up is estimated to be orders of magnitude, compared to conventional ones.

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