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The NUMEN project at INFN-LNS: R&D activity on new detection technologies

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The physics case of neutrino-less double beta decay and in particular, the crucial aspect of the nuclear matrix elements entering in the expression of the half-life of this process will be briefly introduced.

The novel idea of using heavy-ion induced reactions as tools for the determination of these matrix elements will be then presented in the framework of the NUMEN project of INFN [1]. The proposed strategy to this research will be sketched also in view of the proposed upgrade of the Superconducting Cyclotron and of the MAGNEX spectrometer [2]. In particular, the challenges of a focal plane detector for heavy ions able to guarantee high resolution in tracking and particle identification up to detection rates as high as several MHz will be discussed. The crucial technologies of micro-pattern gas detectors for the tracker and of SiC for the stopping detector will be presented.

[1] F.Cappuzzello et al., Eur. Phys. J. A (2015) 51: 145

[2] F.Cappuzzello et al., Eur. Phys J. A (2016) 52: 167

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