GSI - FAIR Colloquium

KBW Lecture Hall (1.17), 64291 Darmstadt, Planckstraße 1

Tuesday, June 28, 2016,
16:15 Uhr (Tee ab 15:45)

Pre-colloquium for students at 15:30

Francesco Cappuzzello - University of Catania

The nuclear matrix elements of 0vbb decay and the NUMEN project at INFN-LNS

The physics case of neutrino-less double beta decay and its tremendous implications on particle physics,cosmology and fundamental physics will be introduced. In particular, the crucial aspect of the nuclear matrix elements [1] entering in the expression of the half-life of this process will be deepened. The novel idea of using heavy-ion induced reactions as tools for the determination of these matrix elements will be then presented. The strengths and the limits of the proposed methodology will be indicated. New data from MAGNEX facility [2] at the INFN-LNS laboratory give first evidences of the possibility to get quantitative results about nuclear matrix elements from experiments [3].
Finally, the NUMEN [4] project of INFN and the proposed strategy to this research will be sketched also in
the view of the emerging technologies proposed.

[1] Report to the Nuclear Science Advisory Committee, Neutrinoless Double Beta Decay (2015) http://science.energy.gov/~/media/np/nsac/pdf/docs/2016/NLDBD_Report_2015_Final_Nov18.pdf.
[2] F.Cappuzzello et al., Eur. Phys J. A (2016) in press.
[3] F.Cappuzzello et al., Eur. Phys. J. A (2015) 51: 145
[4] F.Cappuzzello et al. Eur. Phys. J. Web of Conferences , 117 10003 (2016)

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