

Invited Talk: Recent results from the use of fast-timing arrays and future perspectives.

Friday, 19 April 2024 11:30 (30 minutes)

The development of scintillator detectors e.g. LaBr₃(Ce) which have excellent timing resolution (FWHM ~300 ps @ 511 keV) and reasonable energy resolution (~25 keV @ 511 keV) has led to a resurgence in experiments to measure lifetimes of excited nuclear levels in the ps to ns regime. The FATIMA (= FAsTImingArray) array is a system of 36 LaBr₃(Ce) detectors built for use at the Facility for Antiproton and Ion Research in Europe (FAIR), Germany. Prior to its use in FAIR, FATIMA has been tested and commissioned in experiments on ¹⁰²Zr at the Radioactive Ion Beam Facility (RIBF) at RIKEN, Japan in conjunction with the EURICA germanium-detector array [1], and on ¹¹⁴Pd at Argonne National Laboratory, USA in conjunction with the Gammasphere germanium-detector array [2]. More recently, first experiments have been done in an experimental campaign at FAIR phase-0 where the FATIMA array was combined with 6 triple-cluster GALILEO germanium detectors, e.g. studying ⁹⁴Pd [3].

In the near future, the FATIMA array will be combined with the KHALA array from Korea to form an array of 82 LaBr₃(Ce) detectors to be used at RIBF. An overview of the performance of the system, first results and of the experiments to be carried out during the RIKEN campaign will be presented.

References:

- [1] F.Browne et al., Phys Rev C96 (2017) 024309.
- [2] E.Gamba et al., Phys Rev C100 (2019) 044309.
- [3] A.Yaneva et al., submitted to Phys. Letts. B

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