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Triple RFQ Trap System for Measuring Neutron Capture of Fission Fragments

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One of the current limitations of predicting the nuclear astrophysics r -process abundance is the lack of data on neutron-rich isotopes; measured neutron-capture cross-sections are the scarcest data. These cross-sections are also invaluable for nuclear reactions and structure in general. The current limitations come from the instability of the target and the projectiles. We proposed a method to overcome this limitation. The goal of this work is the selection and storage of fission fragments in a triple RFQ system. These stored ions will then be hit with an intense neutron beam. The reacted ions will then be ejected and measured using a multiple-reflection time-of-flight mass-spectrometer (MR-TOF-MS).

This poster will mainly focus on the RFQ-3 system that will be installed at Soreq Applied Research Accelerator Facility (SARAF-II)[1], currently under construction in Yavne, Israel. The existing RFQ-3 system [2] will be recommissioned and optimised for this project at Justus-Liebig-University Giessen, Germany. This recommissioning and optimisation will be presented as well as some of the future goals of the project.

[1] I. Mardor *et al.*, Eur. Phys. Jour. A 54: 91 (2018)

[2] E. Haettner *et al.*, Nucl. Instr. Meth. A 880, 138 (2018)

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