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Surrogate reactions in inverse kinematics at heavy-ion storage rings

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Obtaining reliable cross sections for neutron-induced reactions on unstable nuclei nuclei is crucial to our understanding of the stellar nucleosynthesis of heavy elements. However, the measurement of these cross sections is very complicated, or even impossible, due to the radioactivity of the targets involved. Our aim is to circumvent this problem by using the surrogate-reaction method in inverse kinematics at heavy-ion storage rings, which offer unique and largely unexplored possibilities for the study of nuclear reactions.

In this talk, I will present the technical developments and the methodology, which we are developing to perform high-precision surrogate-reaction experiments at the Experimental Storage Ring (ESR) of the GSI/FAIR facility. In particular, I will present the results of the first experiments, which we recently conducted at the ESR, and briefly describe the perspectives for future measurements.

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