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Experimental studies of r-process nuclei at the National Superconducting Cyclotron Laboratory

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Despite more than half a century of intensive research, the nucleosynthesis of heavy nuclei remains is still an open questions in nuclear astrophysics. Besides the unknown scenario where the rapid neutron-capture process occurs, new incognita about the very synthesis mechanism are presently under study. The Puzzle will only be solved when the properties of the neutron-rich nuclei involved are well understood.

In this talk, I will discuss several NSCL r-process motivated experiments aimed at studying beta-decay and structural properties of neutron-rich nuclei. Experimental techniques and analysis methods will be presented, along with new results for nuclei in the region $N=56-60$. Future opportunities will be discussed in the light of the new FRIB and ReA facilities at MSU, emphasizing the type of experiments that will contribute to a deeper understanding of the R-process.

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