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Nuclear Astrophysics with Heavy-Ion Storage Rings

Monday 9 June 2025 10:15 (30 minutes)

Storage rings connected to radioactive beam facilities offer unique experimental environments for measurements of rare decay modes that are otherwise not possible.

I will give an overview about some recent experiments at the Experimental Storage Ring at GSI Darmstadt, Germany, measuring rare decay modes that can only appear in highly-charged ions, for example the measurement of the bound-state beta-decay of 205Tl(81+) and the and its impact on the long-term solar neutrino flux in the LOREX project.

A new research stream that has received a lot of attention in the community in the past 10 years are astrophysically relevant reactions of stored ions with protons. This program is now successfully running and I will highlight some recent results. The next logical step is to investigate the possibility of neutron-capture reactions in inverse kinematics. I will outline some ideas for existing storage rings and which role a storage ring at TRIUMF could play in the future.

Keyword-1

Nuclear astrophysics

Keyword-2

Heavy element nucleosynthesis

Keyword-3

Storage rings

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