

Mass measurements of short-lived nuclides in CSRe and its impact on some issues in nuclear astrophysics

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Recent commissioning of the Cooler Storage Ring at the Heavy Ion Research Facility in Lanzhou enabled us to conduct high-precision mass measurements at the Institute of Modern Physics in Lanzhou (IMP). In the past few years, mass measurements were performed using the CSRe-based isochronous mass spectrometry employing the fragmentation of the energetic beams of ^{36}Ar , ^{58}Ni , ^{78}Kr , ^{86}Kr , and ^{112}Sn projectiles. Masses of short-lived nuclides of on both sides of the stability valley were measured [1–10]. Relative mass precision of down to $10^6 \sim 10^7$ is routinely achieved and some issues in nuclear structure and nuclear astrophysics have been addressed. In this talk, the experimental details are presented and the progress and some typical results are briefly introduced. The impacts of mass values on the reaction paths in rp- and ν p-process of nucleosynthesis in the stellar environments are discussed.

References

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