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Progress and status of the MRTOF-MS at Lanzhou

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SHANS (Spectrometer for Heavy Atom and Nuclear Structure), which is a gas-filled recoil separator located at the Institute of Modern Physics in Lanzhou, is an apparatus used to study the heavy nuclei produced in the heavy-ion-induced fusion reactions. Over the past decade, a dozen of isotopes have been synthesized for the first time on this separator and their structures have been investigated.

An MRTOF-MS (Multi-Reflection Time-of-Flight Mass Spectrometer) with a new configuration different from the existed ones coupled with a CGC (Cryogenic Gas Catcher) and an ion cooling trap system, is being developed at SHANS to extend its research field such as isobaric selection and high precision mass measurement. Each of these three subsystems has passed the test, the transport efficiency of the radio-frequency carpet of the CGC is larger than 80%, the width of the pulsed beam extracted from the trap system is about 300 ns, the mass resolving power of the MRTOF-MS reached 90 000, and an efficiency of about 50% of the mass spectrometer has been obtained.

In this talk, SHANS together with the main experimental results on it will be reviewed, and the design, construction, offline commissioning and performance of CGC, trap and MRTOF-MS will be presented in detail.

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