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The Rare-RI Ring Ready to Explore Terra Incognita

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The Rare-RI Ring at the RIBF/RIKEN facility has been recently commissioned and is now ready to start its mission of measuring masses of extremely rare isotopes. The unique location of the Rare-RI Ring at the RIBF/RIKEN facility presents an extraordinary chance to measure nuclear masses in the Terra Incognita. These nuclear masses are of particular importance in understanding the synthesis of chemical elements via the r-process but also crucial in understanding nuclear structure far from stability.

The Rare-RI Ring is based on the Isochronous Mass Spectrometry technique that allows reaching a mass measurement precision of 10⁻⁶ in less than 1 ms. Therefore, making mass measurements of extremely short-lived nuclei with low production yields possible. The full operation of the Rare-RI Ring has been achieved in three commissioning stages. In this contribution, the three commissioning experiments will be summarized and the current performance will be presented. Finally, the perspective of our physics program will be shown.

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