



Contribution ID: 1152
compétition)

Type: Oral (Student, In Competition) / Orale (Étudiant(e), inscrit à la

****WITHDRAWN** Phase-imaging mass measurements with the Canadian Penning trap mass spectrometer**

Monday 13 June 2016 16:45 (15 minutes)

Roughly half of the elements heavier than iron are thought to be produced through the astrophysical rapid-neutron capture process of nucleosynthesis. Despite its large influence in explaining the observed abundance of heavy elements, much of the r process is still poorly understood. A more thorough library of nuclear data, particularly masses, of neutron-rich nuclei is needed to improve the accuracy and progression of r -process calculations. The Canadian Penning trap mass spectrometer (CPT) is currently located in the CARIBU facility at Argonne National Laboratory where intense radioactive beams of neutron-rich nuclei are produced from the spontaneous fission of ^{252}Cf . Since its move to CARIBU in 2010, the CPT has successfully measured the masses of more than 110 isotopes to a typical precision of $15 \text{ keV}/c^2$ by measuring the cyclotron frequency of ions through a time-of-flight (TOF) technique. An upgrade to a position-sensitive microchannel plate detector at the CPT has facilitated a contemporary technique in the determination of masses by measuring the phases of orbital motion of trapped ions. This phase-imaging method is intrinsically more efficient than the TOF technique, and provides an order of magnitude improvement in mass-resolving power without loss in precision, allowing access to more weakly produced isotopes with shorter half-lives than was previously achievable at CARIBU. The low-energy beamline at CARIBU was recently fitted with a multi-reflection time-of-flight mass separator (MR-TOF) which improved beam purity by more than an order of magnitude. In a preliminary measurement campaign the phase-imaging technique, buoyed by the MR-TOF, has yielded the masses of eight previously unmeasured ground-state rare-earth isotopes, and another three nuclear isomers whose masses were directly measured for the first time. These results and future plans to probe another 1-3 neutrons from stability will be discussed.

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Session Classification: M3-1 Nuclear Astrophysics (DNP) / Astrophysique nucléaire (DPN)

Track Classification: Nuclear Physics / Physique nucléaire (DNP-DPN)