Abstract Submitted
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Analysis of Phase-Imaging Ion-Cyclotron-Resonance Mass Measurements at Argonne National Lab[1] WILLIAM PORTER, University of Notre Dame, RODNEY ORFORD, McGill University, TRENTON KUTA, ANI APRAHAMIAN, University of Notre Dame, GUY SAVARD, University of Chicago, JASON CLARK, Argonne National Laboratory, RAY DWAIPAYAN, University of Manitoba, GRAEME MORGAN, Louisiana State University, DANIEL BURDETTE, MAXIME BRODEUR, University of Notre Dame, FRITZ BUCHINGER, McGill University, TSVIKI HIRSH, LIN LING-YING, Argonne National Laboratory, MARY BURKEY, JEFFERY KLIMES, University of Chicago, KUMAR SHARMA, University of Manitoba — In the realm of nuclear physics, the well-known method of adding up the protons, neutrons, and electrons falls short of giving the true mass of the atom, neglecting the binding energy of the nucleus. Thus, further studies into nuclear structure are warranted, and are especially relevant for nuclear astrophysics in the study of the r-process. The primary contemporary tool for determining the mass of an ion with high precision is the Penning trap. One of the newest methods for increasing the precision of Penning trap mass measurements is known as the Phase-Imaging technique. Using this technique, the measurement of nuclear masses is accomplished by measuring the cyclotron frequency of the isotopes circling within the trap. Using time-dependent position measurements, the phases of the circling ions are used to determine the cyclotron frequency and, subsequently, the nuclear mass. I will report on the measurements of several neutron rich nuclear masses in the rare earth region from Argonne National Lab's Canadian Penning Trap facility.

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