Abstract Submitted
for the DNP16 Meeting of
The American Physical Society

**Measurements of Masses with the Canadian Penning Trap**[1]
TRENTON KUTA, ANDREW NYSTROM, ANI APRAHAMIAN, MAXIME BRODEUR, DANIEL BURDETTE, Univ of Notre Dame, FRITZ BUCHINGER, RODNEY ORFORD, McGill Univ, JASON CLARK, TSVIKI HIRSH, LIN LING-YING, Argonne National Lab, GUY SAVARD, MARY BURKEY, JEFFERY KLIMES, Univ of Chicago, RAY DWAIPAYAN, KUMAR SHARMA, Univ of Manitoba, GRAEME MORGAN, Louisiana Sate University — The primary focus of the Canadian Penning Trap (CPT) located at Argonne National Laboratory is to determine the masses of various isotopes relevant to the *r*process, an astrophysical process thought to be responsible for the creation of half the elements heavier than iron. Currently, the CPT is operating in conjunction with the CAlifornium Rare Isotope Breeder Upgrade (CARIBU) at Argonne National Laboratory's ATLAS facility in an attempt to measure neutron-rich nuclei produced by a 1.0 Curie source of $^{252}$Cf. The mass measurements of these nuclei are accomplished by measuring the cyclotron frequency of the isotopes captured in the trap. This frequency is measured with a position-sensitive microchannel plate (MCP), which records the relative position of the isotope in the trap for different phase accumulation times. This summer, the CPT group was able to successfully measure to a precision of 10 keV/c$^2$ the masses of $^{142}$I and $^{156,158,159}$Nd, which are key nuclei needed to more accurately model the *r*process. This also marks the first time that any of these nuclei had ever been measured.

[1]This work was supported by the National Science Foundation under contract PHY-1205412, the University of Notre Dame, and the U.S. Department of Energy, Office of Nuclear Physics, under Contract No. DE-AC02-06CH11357.

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Date submitted: 25 Jul 2016 Electronic form version 1.4