Abstract Submitted
for the DNP16 Meeting of
The American Physical Society

Magnetic trap design for precision antihydrogen gravity measurement in ALPHA-g at CERN CHUKMAN SO, University of Calgary/TRIUMF, P. AMADRUZ, TRIUMF, W. BERTSCHE, U. Manchester , A. CAPRA, TRIUMF, N. EVETTS, U. British Columbia/TRIUMF, J. FAJANS, UC Berkeley , W. FRAZER, M.C. FUJIWARA, D. GILL, TRIUMF, J. HANGST, Aarhus U., W. HARDY, U. British Columbia, M. HAYDEN, Simon Fraser U., R. HENDERSON, U. Calgary, P. LU, L. KURCHANINOV, TRIUMF, N. MADSEN, U. Swansea, J. MCKENNA, TRIUMF, S. MENARY, York U., T. MOMOSE, U. British Columbia, K. OLCHANSKI, A. OLIN, TRIUMF, F. ROBICHEAUX, Purdue U., J. THOMPSON, York U., R. THOMPSON, U. Calgary, J. WURTELE, UC Berkeley, ALPHA-G COLLABORATION — ALPHA first measured the gravitational mass of antihydrogen atoms in a magnetic minimum trap in 2013, limiting anomalous gravity-like forces coupled to the antiatoms to <75 times the ordinary gravity. A new apparatus is being designed to tighten the limit to much better than order unity. It entails a ˜2 meter long magnetic trap with a vertical long axis to enhance gravity signal. The trap magnets are designed to ensure magnetic up-down asymmetry >1e-5 T in the central region. This field control is achieved by carefully considering the effect of winding errors, the inter-connections between current loops, the location of current leads, shape of slices, as well as the detailed characteristics of superconducting wires.

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Date submitted: 30 Jun 2016 Electronic form version 1.4