Abstract Submitted
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The design and testing of a neutral antihydrogen trap[1] DIRK P. VAN DER WERF, University of Wales Swansea, Swansea, UK, ALON DEUTSCH, UC Berkeley, Berkeley, CA, JOEL FAJANS, UC Berkeley and LBNL, Berkeley, CA, JEFFEY S. HANGST, PAUL BOWE, University of Aarhus, Aarhus, Denmark, BRETT PARKER, Brookhaven National Lab, NY, ALPHA COLLABORATION — CPT conservation can be tested by comparing the 1S-2S electronic transition of hydrogen and anti-hydrogen. These transitions can only be accurately measured when the (anti)-atoms are trapped. In order to confine neutral anti-hydrogen, a multipole magnetic field is added to a conventional Malmberg-Penning trap. Previous measurements have shown that a quadrupolar field has a detrimental effect on the positron and antiproton plasmas needed to produce the anti-hydrogen. Therefore, we chose to use an octupolar field in combination with two mirror coils for trapping the neutral atoms. Using a 0.9:1 Cu/Superconductor cable and a technique developed by Brookhaven National Lab we have been able to design a trap with a well depth of about 1 T. We will report on a technical test of the quench properties of the cable and the magnet using a smaller version of the final trap. A study of the mirror field as a possible switch for dumping the anti-hydrogen out of the trap will be presented. Subsequently we will show the design for the final antihydrogen trap.

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