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Ablation of Be^+ to load a Penning trap for Antihydrogen formation[1] NIELS MADSEN, DANIEL THOMAS MAXWELL, MUHAMMED SAMEED, Swansea University, ALPHA COLLABORATION — Antihydrogen, the antimatter counterpart of hydrogen, is an exciting system for testing fundamental symmetries such a CPT (Charge, Parity and Time) and the weak equivalence principle. The ALPHA collaboration has in recent years made the first precision measurements of both the ground state hyperfine splitting and the ground (1S) to first excited stated (2S) two photon transition in antihydrogen. In addition, ALPHA has recently expanded its discovery potential by adding an apparatus allowing for direct tests of the gravitational acceleration of antihydrogen, thus testing the weak equivalence principle. These initial measurements have benefitted from increased trapping rates of antihydrogen achieved principally by using colder positrons. We plan to improve the trapping rates by using laser-cooled Be^+ to sympathetically cool the positrons. However, a significant challenge has been how to load Be^+ into the Penning trap used for Antihydrogen formation without jeopardizing the antihydrogen formation and trapping. Due to the stringent geometrical constraints we have developed an ablation source that directly produce the Be^+ ions. We present thresholds for production of Be^+ and Be^{++}, as well as the energy distribution of the ablated ions and discuss the implications for loading a trap.

[1]Ablation of Be+ to load a Penning trap for Antihydrogen formation

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