

Anti-Hydrogen Detection and Background Rejection for ALPHA-g

Saturday, 18 February 2023 09:30 (15 minutes)

Antimatter lies at the heart of many of the universe's unanswered questions, but direct study of antimatter structures is technically difficult. ALPHA-g promises the first direct free-fall observation of the Earth's gravitational force acting on anti-atoms, by precisely recording the annihilation positions of anti-hydrogen atoms after a controlled release from a magnetic trap. Reconstructing these annihilations is a unique challenge requiring a specialized detector system. Furthermore, due to low antihydrogen yield and the slow release timescale, the cosmic ray background provides an additional obstacle which requires a secondary detector system to overcome. I describe the implementation of the ALPHA-g time projection chamber and "barrel scintillator" cosmic ray veto, and showcase their ability to meet these goals.

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