

An Helium calorimeter for Anti-Deuteron identification in cosmic rays.

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Low energy anti-deuterons in cosmic rays are considered a golden channel for the search of Dark matter annihilations in the galaxy.

Anti Deuteron Helium Detector (ADHD) project is aiming to study the signatures offered by an high pressure He target for the identification of anti-deuterons in space.

In particular exotic atoms are produced by stopping anti-protons/anti-deuterons in the gas and the captured particle can orbit the He nucleus for microseconds before the annihilation.

This meta-stability is an unique feature for the He target and the characteristic delayed annihilation is a distinctive signature to identify the antimatter nature of the stopping particle.

A prototype of pressurized calorimeter, filled by 200 Bar He, has been characterized with muons and with 70-240 MeV proton beam in the INFN-TIFPA laboratory.

Sensitivity of a possible anti-deuteron space-detector based on pressurized He and the results of the measured response of the He calorimeter will be summarized.

TIPP2020 abstract resubmission?

No, this is an entirely new submission.

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Primary authors: NOZZOLI, Francesco (Universita degli Studi di Trento and INFN (IT)); IUPPA, Roberto (Universita degli Studi di Trento and INFN (IT)); RICCI, Ester (Universita degli Studi di Trento and INFN (IT)); ZUCCON, Paolo (Universita degli Studi di Trento and INFN (IT))

Presenter: NOZZOLI, Francesco (Universita degli Studi di Trento and INFN (IT))

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