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Silicon detector in the ALPHA –experiment for antihydrogen detection

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The aim of the ALPHA experiment at CERN is to trap cold atomic antihydrogen and study it's properties, and ultimately, perform a comparison between hydrogen and antihydrogen atomic spectra. Recently, ALPHA has reached important milestones by demonstrating the ability to trap neutral cold antihydrogen and keep the antiatoms confined over a period of 1000 s. [1,2].

The main diagnostic tool for detecting antihydrogen is a silicon tracking device. The device consists of 120 double sided 128x256 silicon strip detectors and has been constructed at the University of Liverpool. The detector is placed to surround the antihydrogen trap of the ALPHA-experiment at CERN. The detector monitors the annihilation events of antihydrogen or antiproton plasmas and enables the detection of single annihilation events. Description and characteristics of this detector and an overview of the ALPHA experiment will be given.

[1] Nature (2010), doi:10.1038/nature09610
[2] Nature Physics 7, 558–564 (2011), doi:10.1038/nphys2025

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