

Mechanical Study Printed Circuit Boards Bonding for Jefferson Laboratory Detector

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Abstract : One plane X and one plane Y of silicon microstrip detectors will constitute the front part of the Super Bigbite Spectrometer that is under construction and that will be installed in the experimental Hall A of the Thomas Jefferson National Accelerator Facility (Jefferson Laboratory), located in Newport News, Virginia, USA. Each plane will be made up by two nearly identical, 300 μm thick, 10 cm x 10.3 cm wide silicon microstrip detectors with 50 μm pitch, whose electronic signals will be transferred to the front-end electronic based on APV25 chips through C-shaped FR4 Printed Circuit Boards (PCB). A total of about 10000 strips are read-out. This paper treats the optimization of the detector support structure, the materials used through a finite element simulation. A very important aspect of the study will also cover the optimization of the bonding parameters between detector and electronics.

Keywords : FEM analysis, bonding, SBS tracker, mechanical structure

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