

Design and Performance of Serial Powered Single-Sided Modules within an Integrated Stave Assembly for the ATLAS Tracker Barrel Upgrade

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The design and performance of prototype single-sided modules with ABCN-25 front-end chips and 10x10 cm² Hamamatsu silicon strip sensors is presented. A low mass module assembly has been achieved by gluing a single-sided flex circuit, with read out chips, directly onto the sensor. The design exploits the embedded shunt regulation within the ABCN-25 providing for a distributed and scalable powered architecture. This allows for multiple modules to be linked together serially to form larger stave structures of up to 12 modules. The stave's digital I/O is realised as a multi-drop LVDS bus flex cable glued to the stave core assembly using a custom ASIC receiver/transmitter (BCC). The results of preliminary electrical tests with 4 module stavelets will be presented.

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