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Progress and Advances in Serial Powering of Silicon Modules for the ATLAS Tracker Upgrade

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Future detector systems will face technical difficulties with the supply of electrical power to a multitude of sub-detectors. The Serial Powering (SP) scheme is an elegant solution which leads to a great reduction in cable mass, whilst increasing efficiency and reducing cost. In recent years, substantial developments in SP have been made by the ATLAS Tracker Upgrade Community. Initial demonstrator modules and supermodules (known as staves) used the ABCD chip and shunt regulators made from discrete components. Continuous development of the SP architecture has led to shunt regulation within the latest ABCN-25 ASICs themselves. From a system point of view, studies of protection schemes and current sources have advanced greatly. We report recent progress, including first results from a serially powered stavelet using the ABCN-25 chip.

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