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【325】 Serial powering and high hit rate efficiency measurement for the Phase 2 Upgrade of the CMS Pixel Detector.

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A serially powered pixel detector is the baseline choice for the High-Luminosity upgrade of the inner tracker of the CMS experiment. A serial power distribution scheme requires less cable mass, improves power efficiency and is less susceptible to voltage transients than parallel powering. A prototype pixel-readout-chip has been designed for serial powering in 65nm-CMOS technology by the RD53 collaboration. Performance results from testing the prototype, called RD53A, are reported. The performance of RD53A operating in a chain consisting of four serially powered chips is compared with the performance under a conventional powering scheme. Additionally, the readout efficiency of RD53A in a high hit rate environment is presented. The results indicate that serial powering is a robust and reliable power distribution scheme.

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