

# Study of a MAPS detector prototype for the upgrade of the BESIII inner tracker

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After running ten years, the inner drift chamber of the Beijing spectrometer III (BESIII) is suffering from the aging problems that lead to a performance degradation. As one of the prototype schemes of the BESIII inner chamber upgrade, a MAPS (monolithic active pixel sensor) detector prototype is under developed. The mass production and quality verification of the pixel detector ladders with low material budget and high chip position precision have been performed. The ladder consists of ten MIMOSA28 chips thinned to 50  $\mu\text{m}$ , a flex cable and a carbon fiber support. In order to verify the design and quantify the performance of the ladders in terms of the spatial resolution, the detection efficiency, the gap between the neighboring chips and the material budget of the ladder, a detector prototype system, including five layer ladders, readout electronics and data acquisition was set up and tested with electron beam in DESY. The design of the prototype and the test results will be presented.

## Secondary track (number)

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