

Large area curved silicon modules for future trackers

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For many years there has been an aspiration within the community to develop curved silicon detectors for particle physics applications. We present the results from 10x10cm low mass support modules as a part of the “ZeroMass” project that aims to minimise the material budget for tracking and vertexing systems for future colliders. We use 50 μm thick DC coupled strip sensors from Micron Semiconductor Ltd., with a carbon composite support frame. Our current module demonstrators use a radius of curvature of 15cm, typical of that used for the outer parts of large pixel systems, or the inner part of strip trackers and the outer part of large radii vertex detectors. The material budget obtained varies from an X0 of 0.05% in the active area to 0.62% in the support structure, with an average of 0.28%. There is further scope for material budget reduction in applying the concept and methods to large instruments for future detector systems, which we also discuss.

Collaboration

Role of Submitter

I am the presenter

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