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Composite Structures for Tracker Detectors: a Comparison of Sandwich and Stiffened Laminate Configurations

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Support structures for tracker detectors are used to hold the detector's sensors and the associated services. During the structural design process, one of the objectives is to minimize the displacement of the sensors during operation. Two different designs are commonly used: a sandwich arrangement of two laminates and a core, and a single laminate reinforced by local eccentric stiffeners. The former design allows generally for an overall higher stiffness across the whole detector, while the latter can provide only a local increase. On the other hand, the sandwich design can entail an increase of the structural weight. As a function of the geometry and of the applied loads amplitude and distribution one design can be more effective than the other. The analytical study presented here attempts to define optimal applicability boundaries of the two design strategies.

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