

## LHCb SciFi Detector and Read-out box

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The upgrade of the complete LHCb detector will extend the physics reach of the experiment, by allowing it to run at higher luminosity with increased trigger efficiency. The tracking system behind the magnet will be replaced by a new Scintillating Fibre Tracker (SciFi), a modular array of 5 m long layers of scintillating fibers, consisting of six densely packed layers of round fibers with a diameter of 250  $\mu\text{m}$ . The fibers will be read out by Silicon Photomultipliers (SiPMs) housed in the so-called “Read-out Boxes” at the top and bottom of each fiber module.

We will present a summary of the main SciFi design choices, and discuss in detail the specific challenges posed by the design of the Read-out Boxes (where fiber modules, photon detectors and on-detector readout electronics are integrated) stemming from thermal expansion and contraction (different CTE's in combination with  $\Delta T$ 's of 90°C), condensation and frost prevention, and high positioning accuracies.

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