



Contribution ID: 12

Type: **not specified**

# Test beam results of the LHCb Scintillating Fibre Tracker

*Thursday, 18 January 2018 09:00 (20 minutes)*

The Scintillating Fibre (SciFi) Tracker is designed to replace the current downstream tracking detectors in the LHCb Upgrade during 2019-20 (CERN/LHCC 2014-001; LHCb TDR 15). Collecting data at the increased luminosity foreseen for the upgrade will only be possible with front-end electronics read out at 40MHz and a flexible software-based triggering system that will increase the data rate as well as the events-of-interest efficiency. The SciFi Tracker is based on 2.5 metre long multi-layered ribbons from a total of 10000 km of 0.250 mm diameter scintillating fibre as the active medium and signal transport over 12 planes covering 350 m<sup>2</sup>. Cooled silicon photomultiplier (SiPM) arrays with 128 channels and 0.25 mm channel width are used as read-out. The front-end electronics are designed to digitise the signals from the SiPMs with a custom ASIC chip, the PACIFIC, for the approximately 500k channels and reconstruct the track hit position within an on-board FPGA. The PACIFIC is a 64-channel chip with a fast 10-ns shaping time, dual 25 ns interleaved integrators, and provides binary signal-over-threshold information from three signal comparators per channel. This presentation will cover the test beam results and experiences from 2017 and earlier at the CERN SPS and DESY-2 facilities regarding the performance of the fibre tracker modules and the PACIFIC ASIC.

**Primary author:** Dr LEVERINGTON, Blake Dean (Ruprecht-Karls-Universitaet Heidelberg)

**Presenter:** Dr LEVERINGTON, Blake Dean (Ruprecht-Karls-Universitaet Heidelberg)

**Session Classification:** Analysis