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# A 4D fast tracking detector for the high-luminosity LHC

*Tuesday, 26 May 2020 14:54 (18 minutes)*

We present recent results of the R&D for a novel 4D fast tracking system based on rad-hard pixel detectors and front-end electronics capable of reconstructing 4-dimensional particle trajectories in real time. The detector features excellent timing resolution of 30 ps, recently measured on a beam test, and 55 micron pitch for the 3D silicon pixel sensor. A stub-based fast tracking algorithm has been implemented and tested in commercial FPGA using a pipelined architecture and allows reconstruction at 40 MHz event rate. Tracking performance for a 4D pixel detector for a future upgrade of the LHCb experiment will be also discussed.

## Funding information

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