

Abstract Submitted  
for the APR21 Meeting of  
The American Physical Society

**Construction and Measurement of Mechanical Components for the LHCb Upstream Tracker** HARRIS BERNSTEIN, Syracuse University, LHCb COLLABORATION COLLABORATION — The LHCb experiment is designed to study CP violation and other rare phenomena by observing decays of beauty and charm hadrons. A major upgrade of the LHCb detector is being installed during the LHC's second long shutdown, which will equip the detector to take data at a higher luminosity and read out its electronic components at a rate of 40 MHz. The Upstream Tracker is a major part of this upgrade. It is a new silicon strip detector, located upstream of the LHCb bending magnet, composed of four planes of silicon sensors mounted on both sides of vertical structures called staves which provide mechanical support and CO<sub>2</sub> evaporative cooling. The staves are a sandwich structure design consisting of carbon fiber facing sheets surrounding a foam core in which titanium cooling tubes are embedded. The staves support flexible printed circuit board cables on which the sensors and application specific integrated circuits will be attached. There are three different types of stave design, with different types of cable and sensor designs according to occupancy. In this contribution, the ongoing stave construction is reviewed with emphasis on mechanical measurements of its components and sub-assemblies. Specific attention is given to the attachment of the flex cables, the fabrication of the cooling tube sub-assemblies, and their associated metrics.

Harris Bernstein  
Syracuse University

Date submitted: 07 Jan 2021

Electronic form version 1.4