

Abstract Submitted  
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**Metrology for the ATLAS Inner Detector Pixel Upgrade<sup>1</sup>** NEHA SINGH, KATHRYN GRIMM, California State University, East Bay, ATLAS COLLABORATION — ATLAS (A Toroidal LHC Apparatus) is a detector at the Large Hadron Collider (LHC) at CERN used for particle physics investigation and analysis. The inner most layer is the pixel detector that will be removed and upgraded with an all-silicon sensor called the Inner Tracker (ITk). The ITk upgrade will provide better resolution and efficiency to support a higher track density, created by the High-Luminosity-LHC (HL-LHC). Two hundred particle collisions per bunch crossing are expected ( $\langle\mu\rangle = 200$ ), an increase from  $\langle\mu\rangle = 30$  in the most recent LHC run. Additionally, existing components need to be replaced after years of heavy radiation damage. The upgraded pixel detector will consist of sensor modules glued to stave and ring components. To ensure correct construction, the components must be measured with micron-level precision using a coordinate measuring machine (CMM). This metrology is performed using the camera probe of the CMM and a part program that measures the placement of the modules onto the components. This talk will discuss the ITk upgrade and highlight the metrology procedures that will be used to qualify the detector component assembly.

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Neha Singh  
California State University, East Bay

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