

Project Description - Study of Truncated Events in the ATLAS Pixel Detector

A primary challenge in the design and operation of the ATLAS pixel detector is dealing with the enormous amount of data the such a device could potentially produce: 80 million channels read out every 25 ns. In addition to aggressive zero-suppression, there are a number of data bottlenecks in the system where a cap is placed on the size of the data coming from the detector. In cases where the data exceeds these caps, the output is truncated, resulting in a loss of information about what happened in those events. Even at relatively low luminosities, the rate of truncations observed has been larger than anticipated, leading to concerns regarding the robustness of operation at much higher luminosities in the future.

In a continuation of work begun by a rotation student (Max Swiatlowski) in the Summer of 2010, data from recent operation of the ATLAS detector will be used to isolate and understand the nature and causes of these truncations. In particular, we are interested in understanding how they relate to specific backgrounds, beam conditions and instabilities observed in the ATLAS pixel DAQ.

Please contact [Tim Nelson](#) for more information regarding this project.