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Applying a Model to Describe the Radiation-induced Leakage Current in the ATLAS Silicon Detector JAYASHANI WICKRAMASINGHE, SALLY SEIDEL, MARTIN HOEFERKAMP, University of New Mexico — Silicon pixel detectors, which are located at the heart of the ATLAS detector, are exposed to high radiation. This damages the sensors, making it necessary to regularly adjust their operating conditions to maintain efficient detection for as long as possible. Sensor leakage current data are used to quantify the radiation damage. The Hamburg Model was developed to describe the leakage current as a function of fluence, temperature, and time. This model is important for predicting the operation of the detector under future conditions. In its present form, computer code for the model requires lengthy runs in order to acquire statistics relevant to LHC scenarios. A project is underway to parallelize this code in order to reduce the run time for producing large statistical data sets.

Jayashani Wickramasinghe
University of New Mexico

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