EXPERIMENTAL PHYSICS DIVISION SEMINAR

INSTITUTE OF HIGH ENERGY PHYSICS, CAS

Cold Noise in ATLAS ITk strip detectors

Speaker: Dr. Matthew Kurth (IHEP)

Host: Prof. Peilian Liu

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Abstract:

ATLAS Inner Tracker (ITk) will be the new all-silicon track detector for ATLAS in the HL-LHC. The ITk strip group have recently entered the production phase of 165 m^2 of silicon microstrip sensors. During the pre-production phase there was a unforeseen obstacle to maintaining low-noise performance while at the operational temperature of -35^{o}C. The obstacle of "Cold Noise" was investigated and identified as originating not from electromagnetic interference but rather from a mechanical vibration. This mechanical vibration originates on the power board and propagates across the sensor. It is converted back into an electrical signal and readout in the strips which increases the noise in certain locations. A mitigation strategy has been implemented for ITk Strip production that prevents elevated noise at low temperatures.

About the speaker:

Dr. Matthew Kurth is a Postdoctoral researcher of IHEP based at Rutherford Appleton Laboratory in the United Kingdom where he is working on ATLAS ITk strip. He is leading Rutherford Appleton Laboratory' s ITk strip module production as well as leading the magnetic field protection studies for ITk strip and leading the Cold Noise investigations for the UK/China cluster.