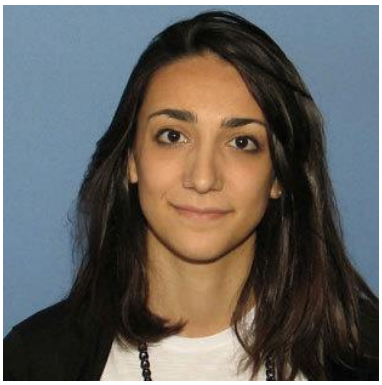
LABORATORY FOR ELEMENTARY-PARTICLE PHYSICS (LEPP)

Journal Club

Caterina Vernieri

Fermilab



The CMS Pixel detector from Physics requirements to Pixel Technology

The CMS experiment has an ongoing R\&D plan to develop a new tracking system able to operate at and above the design luminosity of the HL-LHC. In particular the pixel detector will be replaced with a new one to maintain a high tracking and b-jet identification efficiency at luminosities up to 5$\cdot$10^{34} cm^{-2}s^{-1}. The HL-LHC CMS Pixel will extend the eta coverage from the present $\eta=$2.5 to $\eta=$4, will have smaller pixels and will be capable to withstand one order of magnitude higher radiation damage. The foreseen integrated luminosity of 3000 fb^{-1} together with the high particle rates demands sensors with higher granularity and a sensor design with limited dead area surrounding the active Pixel array.

The seminar will cover the physics motivation for a high granularity pixelated detector, the basic concepts of silicon detector technology and the ongoing development of pixel silicon sensors. Results will be shown from pixelated sensors with the regular 100 μm pitch and with pitches reduced to 50 and 25 μm and from other sensor prototypes where the inactive area surrounding the pixel array has been reduced to 200 μm.

Friday, August 26, 2016

4:00pm

301 Physical Sciences Bldg.