



LBNL Nuclear Physics Forum

Monday, February 12, 2018 @ 11:00 am

Building 88 Lounge (2nd floor)

Cookies and coffee available from 10:45am

Ms. Chelsea Bartram

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“Search for CPT-violation in Positronium”

CALIOPE, or $CP(T)$ Aberrant Leptons in o-Ps Experiment, is a search for CPT -violating angular correlations in the decay of ortho-positronium (o-Ps). Using a tagged source flush against a cylindrical piece of aerogel, we generate positronium at the center of APEX, an annular array of 24 NaI(Tl) bars. Gamma rays emitted in the decay of o-Ps interact in the NaI(Tl) and the resulting scintillation light is detected by PMTs that are optically coupled to the end of each bar. Signals from the PMT feed into the DAQ, which uses QDCs and TDCs to record the charge amplitude of pulses and timing information. I will present commissioning data from CALIOPE, including the first detection of o-Ps. I will discuss the design of the DAQ and process of isolating o-Ps events using various analysis cuts. I also will present a detailed study of systematics resulting from Geant4 Monte Carlo simulations and our anticipated improvement over a previous search for CPT -violation in o-Ps.

