



Contribution ID: 256

Type: **Parallel contribution**

Searching for Coherent Neutrino Scattering at a Decay-at-Rest Neutrino Source

Friday, 12 August 2011 11:30 (20 minutes)

Coherent elastic neutrino- and WIMP-nucleus interaction signatures are expected to be quite similar. Next-generation ton-scale dark matter detectors could discover neutrino-nucleus coherent scattering in an underground laboratory. A high intensity pion- and muon- decay-at-rest neutrino source recently proposed for oscillation physics at underground laboratories would provide the neutrinos for these measurements. We show that discovery of this interaction is possible with a 2 ton year exposure of a ton-scale experiment such as GEODM. Furthermore, a dedicated coherent scattering experiment using low-temperature Ge crystals and/or noble liquids placed close (~ 10 m) to the neutrino source would see hundreds to thousands of events per year. These higher statistics would enable new limits on non-standard neutrino interactions and searches for sterile neutrinos through short-baseline oscillations. We discuss the potential sensitivity of such an experiment to light sterile neutrino models with Δm^2 of order 1 eV^2 , a region that contains the best-fit 3+1 and 3+2 models to LSND and MiniBooNE data.

Primary author: Prof. FIGUEROA-FELICIANO, Enectali (MIT)

Co-authors: Mr ANDERSON, A. (MIT); Ms IGNARRA, C. (MIT); Dr KARAGIORGI, G. (Columbia University); Prof. CONRAD, J. M. (MIT); Dr SPITZ, J. (Yale University); Prof. SCHOLBERG, K. (Duke University); Prof. SHAEVITZ, M. H. (Columbia University)

Presenter: Prof. FIGUEROA-FELICIANO, Enectali (MIT)

Session Classification: Neutrino Physics

Track Classification: Neutrino Physics