Abstract Submitted
for the APR14 Meeting of
The American Physical Society

Improving the estimation of reactor antineutrino spectra MAREK KOS, DAVID ASNER, KIMBERLY BURNS, BRYCE GREENFIELD, MALACHI SCHRAM, JOHN ORRELL, LYNN WOOD, BRENT VANDEVENDER, DAVID WOOTAN, Pacific Northwest National Lab — The flux of antineutrinos emanating from reactors has been used for a range of experiments studying neutrino properties. Results from these experiments are in tension with models that have mixing only among the three active neutrino flavors of the Standard Model. Knowledge of reactor antineutrino flux is based on inversion of total reactor beta spectra measured at the Institut Laue Langevin in the 1980s. Recent reanalysis of that data has resulted in a signficant 3% upward shift in the antineutrino flux with implications for the possible existence of sterile neutrinos. We explore the possibility that the present situation could be improved with a new measurement of the underlying reactor beta spectrum. Possibilities are considered to improve knowledge of the beta source by using actinide foils activated in a neutron beam tailored to the energy spectrum found in a reactor core, and magnetic beta spectroscopy with tracking to suppress backgrounds and control systematics.

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Date submitted: 10 Jan 2014 Electronic form version 1.4