

A new measurement of reactor antineutrino disappearance using neutron captures on hydrogen and gadolinium in the Double Chooz far detector

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To enhance sensitivity to electron antineutrino oscillations, the Double Chooz collaboration has developed a variety of innovative analysis techniques. Double Chooz is the only reactor antineutrino experiment to expand the inverse beta decay search to include neutron captures on hydrogen as well as the standard gadolinium captures. As of summer 2013, it is the only experiment of its kind to exploit the energy dependence of oscillations. Finally, through a separate study based on reactor power modulation, Double Chooz has made the only $\sin^2 2\theta_{13}$ measurement which does not depend on *a priori* predictions of background rates or spectra. In this talk, we report a new rate-and-energy-spectrum analysis which combines Double Chooz hydrogen and gadolinium capture results. We also report results of a reactor power-based analysis with unique independence from background modeling.

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Primary author: CARR, Rachel (Columbia University)

Presenter: CARR, Rachel (Columbia University)

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