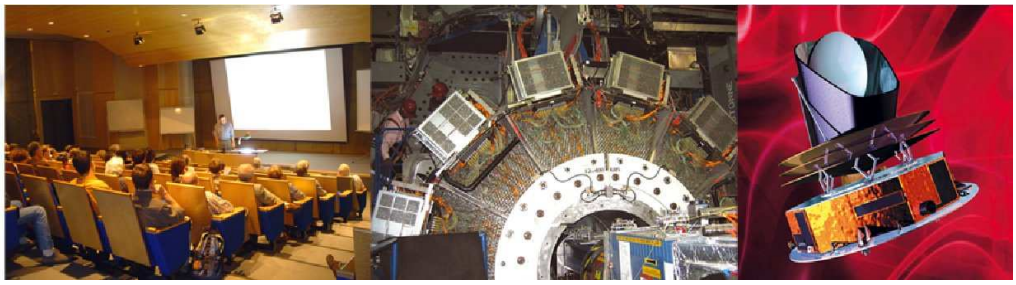
LABORATOIRE DE L'ACCÉLÉRATEUR LINÉAIRE



Séminaire du Laboratoire de l'Accélérateur Linéaire

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CEA Saclay

Mardi 19 Avril 2011 à 11 :00

The reactor anti-neutrino anomaly

Recently new reactor antineutrino spectra have been provided for ^{235}U, ^{239}Pu, ^{241}Pu and ^{238}U, increasing the mean flux by about 3 percent. To good approximation, this reevaluation applies to all reactor neutrino experiments. The synthesis of published experiments at reactor-detector distances <100 m leads to a ratio of observed event rate to predicted rate of 0.976(0.024). With our new flux evaluation, this ratio shifts to 0.943(0.023), leading to a deviation from unity at 98.6% C.L. which we call the reactor antineutrino anomaly. The compatibility of our results with the existence of a fourth non-standard neutrino state driving neutrino oscillations at short distances is discussed. The combined analysis of reactor data, gallium solar neutrino calibration experiments, and MiniBooNE- neutrino data disfavors the no-oscillation hypothesis at 99.8% C.L. The oscillation parameters are such that $|\Delta m^2_{new}| > 1.5\ eV^2$ (95%) and $sin^2(2\theta_{new}) = 0.14(0.08)$ (95%). Constraints on the θ_{13} neutrino mixing angle are revised.

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