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Full-Volume Calibration of KamLAND and Precision Measurement of Oscillation Parameters KARSTEN M. HEEGER, KAMLAND COLLABORATION — The Kamioka Liquid scintillator Anti-Neutrino Detector (KamLAND) has measured the flux of anti-neutrinos from nearby nuclear power plants in Japan and made the first observation of the disappearance of reactor $\overline{\nu}_e$. Recent measurements by KamLAND show evidence of spectral distortion, a clear sign of neutrino oscillation, and provide the most precise determination of the oscillation parameter Δm^2_{12}. KamLAND's measurement of neutrino oscillation parameters is currently limited by systematics, primarily the determination of the fiducial volume. Calibrations throughout the entire detector volume are required to fully exploit KamLAND's physics potential. This talk will describe the development of a novel calibration system and the expected improvements to KamLAND's measurement of $\overline{\nu}_e$ oscillation parameters.

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