Plenary
Solar Neutrinos

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Solar neutrino experiments have been in progress since the pioneering radiochemical measurements of Ray Davis starting in the 1960's. Since then, measurements with Cl (Homestake), Ga (SAGE, Gallex, GNO) and light water (Kamiokande, Super-Kamiokande), with varying detection thresholds, indicated that the fluxes of neutrinos detected were smaller than predicted by solar models. Recent measurements by the SNO experiment using heavy water have used a charged current (CC) reaction on deuterium sensitive to electron neutrinos and a neutral current (NC) reaction sensitive to all active neutrino types to provide strong evidence for solar neutrino flavor conversion. Similar conclusions with lower certainty can be obtained by comparison of SNO CC and Super-Kamiokande neutrino-electron elastic scattering results. The total flux of active neutrinos above 2.2 MeV, measured with the NC reaction in SNO, is found to be in agreement with the predictions of solar models for the total flux of electron neutrinos from ^8B decay in the Sun. Flavor change solely to sterile neutrinos is strongly disfavored. The overall set of solar neutrino measurements to date, including studies of time variations of fluxes, will be discussed, along with their interpretation in terms of neutrino oscillation including matter-enhancement effects. A global fit to all solar neutrino measurements defines a best fit region of parameter space near $\Delta m^2 = 1 \times 10^{-4}$ eV^2 and $\tan^2\theta < 1$ (LMA region). Future solar neutrino measurements and their potential to provide further information on neutrino and solar properties will be discussed.