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Measuring the Solar Neutrino Spectrum

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Efforts to measure the solar neutrinos spectra have already proven to be very rewarding. Neutrino oscillations have been definitely observed in the higher energy part of the spectra, and, coupled with the MSW mechanism, can explain the integral lower-energy flux measurements to date. However, there is still no direct signature that MSW oscillations are indeed the full explanation. Also, the luminosity of the Sun, as determined by its emitted photon flux, compared to its luminosity as determined by neutrino measurements, still differ by 20 to 40% at one sigma. There could be several reasons for this: θ_{13} is non-zero, there are other sources of energy in the Sun, the photons coming from the surface of the Sun reflect an older Sun than seen with neutrinos produced only minutes ago, or perhaps some entirely new phenomena. Thus, current experiments to measure the ${}^7\text{Be}$ neutrino flux, in the middle of the solar spectra, are of major importance. This talk will describe the progress to date of the Borexino and KamLAND experiments designed to measure this flux. Likewise, accurately measuring the pp-neutrino flux, over 90% of the total flux from the Sun, still remains to be done. This talk will describe the upcoming experiments designed to meet this challenge and what we can expect to learn.