Solar Neutrinos

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Around 1970, the Homestake experiment conducted by R. Davis et al. suggested that the observed solar neutrino flux is smaller than that expected from the standard solar model, which had been called "the solar neutrino problem". In 1988, the Kamiokande experiment confirmed the problem using neutrino-electron scattering with the real time experiment. The solar neutrino problem was eventually solved in July 2001 by comparing the fluxes measured by the SNO experiment at Canada and the Super-Kamiokande(SK). It was found that the solution to the problem is neutrino oscillations. Precise observation of solar neutrinos has been continuously running at SK. Recently, it was observed that the nighttime flux is a few percent larger than the daytime flux because of the matter effect of the earth. And SK is now trying to observe the energy spectrum distortion due to the matter effect in the sun.