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Solar neutrino based redetermination of the 7Be(p,gamma)8B S-factor

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Among the solar fusion reactions, the rate of the ^{7}Be$(p,\gamma)^8$B reaction is one of the most difficult to determine. In a number of previous experiments, its astrophysical S-factor has been measured at E = 0.1-2.5 MeV center-of-mass energy. However, no experimental data are available below 0.1 MeV. Thus, an extrapolation to solar energies is necessary, resulting in significant uncertainty for the extrapolated S-factor.

On the other hand, the flux of solar neutrinos has been recently measured with high precision, which provides an opportunity to turn the problem of the S-factor determination around: Using the measured ^{7}Be and ^{8}B neutrino fluxes, and the Standard Solar Model, the ^{7}Be$(p,\gamma)^8$B astrophysical S-factor is determined here at the solar Gamow peak.

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