

LABORATORI NAZIONALI DEL GRAN SASSO

SEMINAR ANNOUNCEMENT

On October 17, 2008, at 9:50 am, V. Gavrin from INR Moscow will give a seminar entitled:

“Contribution of Ga experiments for understanding of the Sun physics in light of the latest results of SAGE”

Abstract

The Russian-American Experiment SAGE measures the solar neutrino capture rate beginning December 1989. Assuming the solar neutrino production rate was constant during the period of the data collection, combined analysis of 168 runs through December 2007 gives a capture rate of solar neutrinos with energy more than 233 keV of $65.4+3.1/-3.0(\text{stat.})+2.6/-2.8(\text{syst.})$ SNU.

The waited average of the results of all three Ga solar neutrino experiments, SAGE, GALLEX, and GNO, is now 66.1 ± 3.1 SNU, where statistical and systematic uncertainties have been combined in quadrature. The recent test of SAGE with reactor produced ^{37}Ar neutrino source showed that ratio of the observed rate to calculated in this experiment combined with the measured rates in the three prior ^{51}Cr neutrino source experiments with Ga, is 0.88 ± 0.05 . A probable explanation for this law results is that the cross section for neutrino capture by the two lowest excited states in ^{71}Ge has been overestimated. If one assumes these cross sections are zero, than the Standard Solar Model with neutrino oscillations predicts a total capture rate in Ga in the range of 63-68 SNU with an uncertainty of about 5%, in good agreement with experiment. The derived current value of the pp neutrino flux produced in the Sun is $(6.1+/-0.8) \times 10^{10}/(\text{cm}^2\text{s})$ which agrees well with the flux predicted by the Standard Solar Model. Several tests were made which show that the data are consistent with the assumption that the solar neutrino production rate is constant in time.

(“E. Majorana” room)