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## New Solar $7\text{Be}$ rate and day night effect measurements in Borexino

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Two new experimental data about solar  $7\text{Be}$  neutrinos have been released in the middle April 2011 by the Borexino collaboration: the new high precision interaction rate and the absence of the day night effect. The two results will be discussed together with their physical consequences about low energy neutrino oscillations.

### Summary

A direct measurement of the 0.862 MeV  $7\text{Be}$  solar neutrino interaction rate performed with the Borexino detector at the Laboratori Nazionali del Gran Sasso yields  $46.0 \pm 1.5_{\text{stat}} \pm 1.6-1.5_{\text{syst}}$  counts/(day100 ton). This result is the first direct measurement of a sub-MeV solar neutrino rate with an accuracy better than 5%. The hypothesis of no oscillation for  $7\text{Be}$  solar neutrinos is rejected at 4.9 % C.L. Using the latest Standard Solar Model (SSM) flux predictions, the result leads directly to a precise determination of the survival probability for solar neutrino in vacuum, and permits to probe with unprecedented sensitivity the transition between the matter-enhanced and vacuum-dominated neutrino

I will in addition report on a search for the day-night asymmetry of the  $7\text{Be}$  solar neutrino rate measured by Borexino at the Laboratori Nazionali del Gran Sasso (LNGS), Italy. The measured value,  $A_{\text{dn}} = 0.001 \pm 0.012_{\text{(stat)}} \pm 0.007_{\text{(syst)}}$ , shows the absence of a significant asymmetry. This result alone rejects the so-called LOW solution at more than 8.5 sigma. Combined with the other solar neutrino data, it isolates the Large Mixing Angle LMA-MSW solution at  $\chi^2 > 190$  without relying on the assumption of CPT symmetry in the neutrino sector. We also show that including the day-night asymmetry, data from Borexino alone restricts the MSW neutrino oscillations to the LMA solution at 90% CL.

**Primary author:** TESTERA, Gemma (GE)

**Presenter:** TESTERA, Gemma (GE)

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