LNGS SEMINAR SERIES

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Final model independent result of DAMA/LIBRA–phase1

The results obtained with the total exposure of 1.04 ton × yr collected by DAMA/LIBRA–phase1 deep underground at the Gran Sasso National Laboratory of the I.N.F.N. during 7 annual cycles (i.e. adding a further 0.17 ton × yr exposure with respect to the previous data release) are presented. The DAMA/LIBRA–phase1 data give evidence at 7.5 sigma C.L for the presence of Dark Matter (DM) particles in the galactic halo on the basis of the exploited model independent DM annual modulation signature by using highly radio-pure NaI(Tl) target. When including also the first generation DAMA/NaI experiment (cumulative exposure: 1.33 ton × yr, corresponding to 14 annual cycles), the C.L. is 9.3 sigma. No systematic or side reaction able to mimic the exploited DM signature (i.e. able to account for the whole observed annual modulation amplitude and simultaneously satisfy all the many peculiarities of the signature) has been found or suggested by anyone over more than a decade. The perspectives of the presently running DAMA/LIBRA-phase2 (started after the upgrade where all the PMTs have been replaced with new ones having larger quantum efficiency) will be outlined. Other results also achieved with the same set-up in searches for other rare processes will be just mentioned.

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