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Annual modulation results from DAMA/LIBRA

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The DAMA/LIBRA experiment (about 250 kg of highly radio-pure NaI(Tl)), is running deep underground at the Gran Sasso National Laboratory (LNGS) of the I.N.F.N.; its main aim is the investigation of Dark Matter (DM) particles in the Galactic halo by pursuing the model independent DM annual modulation signature. The results released so far have been obtained with the data of the first phase of measurements (DAMA/LIBRA-phase1) lasted for seven annual cycles with an exposure of 1.04 ton x yr and the data of the second phase (DAMA/LIBRA-phase2), with lower software energy threshold of 1 keV. The DAMA/LIBRA—phase2 has released so far data corresponding to 8 annual cycles for a cumulative exposure of 1.53 ton x yr. DAMA/LIBRA data (and those of the former DAMA/NaI set-up) give evidence for the presence of DM particles in the galactic halo with 13.7s C.L. in the energy region below 6 keV. No systematic or side reaction able to mimic the exploited DM signature has been found. The obtained DAMA model independent result is compatible with a wide set of scenarios regarding the nature of the DM candidate and of the related
astrophysical, nuclear and particle physics models. The experiment has been further upgraded in October 2021 when new pre-amplifiers with HV divider system, and new Transient Digitizers have been installed. This last phase of measurement is ongoing. In this talk, a summary of the results obtained so far by DAMA/LIBRA will be presented and the perspectives of the present new presently running configuration will be discussed.

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