Contribution ID: **237** Type: **Oral**

Strong Constraints on the DAMA/LIBRA Modulation Signal from ANAIS-112

Monday 25 August 2025 18:00 (20 minutes)

For over two decades, the DAMA/LIBRA experiment has reported an annual modulation in the low-energy region, consistent with the expectation from dark matter (DM) in the galactic halo due to Earth's motion around the Sun. For most WIMP candidates, this result is excluded by the null results of other experiments, making it one of the most puzzling anomalies in the field. However, such comparisons are model-dependent, as these experiments use different target materials with respect to DAMA/LIBRA (NaI(Tl) scintillators).
In recent years, the ANAIS-112 and COSINE-100 experiments, which also employ NaI(Tl) detectors, have obtained results that are incompatible with those of DAMA/LIBRA at a high confidence level, leaving little room for a DM interpretation of the observed modulation.
The ANAIS-112 experiment uses 112.5 kg of NaI(Tl) detectors at the Canfranc Underground Laboratory and it has been taking data since August 2017. In this talk we will present the results of the annual modulation analysis corresponding to six years of ANAIS–112 data, that are the most sensitive to date with the same target material. Results are incompatible with the DM interpretation of the DAMA/LIBRA modulation signal at a 4σ confidence level.
We will also review the systematic uncertainties affecting the comparison, particularly those related to the response of detectors to nuclear recoils.

Collaboration you are representing

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Session Classification: Dark Matter and Its Detection

Track Classification: Dark Matter and Its Detection