

The COSINUS dark matter search experiment

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Today, direct dark matter detection results are contradicting: the DAMA/LIBRA experiment observes an annual modulation signal at high confidence. Furthermore, this signal is perfectly compatible in terms of period and phase with the expectation for a galactic halo of dark matter particles interacting in their NaI target crystals. However, in the so-called standard scenario on dark matter halo and dark matter interaction properties, the DAMA/LIBRA signal contradicts the null results of numerous other experiments.

The new experiment COSINUS aims for a model-independent cross-check of the DAMA/LIBRA signal. Such a cross-check has been absent for now and necessarily requires using the same target material (NaI). COSINUS is the only NaI-based experiment operating NaI as a cryogenic detector, which yields several distinctive advantages: discrimination between electronic interactions and nuclear recoils off sodium and iodine on an event-by-event basis, a lower nuclear recoil energy threshold, and a better energy resolution. We finished the construction of the COSINUS experiment at LNGS in 2023; the cryostat is already running at base temperature. In this contribution, we will report on the prototype demonstrator measurement and give an outlook on the last steps towards the start of the data taking.

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