

COSINUS: Direct dark matter search with cryogenic NaI detectors

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Today, the situation in direct dark matter detection is controversial: 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 which interact 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 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 is absent up to now and necessarily requires the use of the same target material (NaI). While several experimental efforts are planned or already ongoing, COSINUS is the only experiment operating NaI as cryogenic detector which yields several distinctive advantages: Discrimination between electronic interactions and nuclear recoils off sodium and iodine on event-by-event basis, a lower nuclear recoil energy threshold and a better energy resolution. In this contribution we will review the prototype measurements performed so far, present the plans for the new underground facility currently installed at LNGS and give an outlook on the COSINUS timescale.

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