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RES-NOVA - Detecting astrophysical neutrinos using archaeological-Pb-based cryogenic detectors

martedì 18 giugno 2024 17:30 (2 ore)

The RES-NOVA project hunts neutrinos from the cosmos (e.g. Sun, Supernovae) via coherent elastic neutrino-nucleus scattering (CEνNS) using an array of archaeological lead (Pb) based cryogenic detectors. The high CEνNS cross-section on Pb and the ultra-high radiopurity of archaeological Pb enable the operation of a highly sensitive neutrino observatory, equally sensitive to all neutrino flavors, with dimensions at the cm-scale. The first phase of the RES-NOVA project is planning to operate a demonstrator detector with a total volume of about (30 cm)3. It will be sensitive to SN bursts from the entire Milky Way Galaxy with >3σ sensitivity while running PbWO4 detectors with a 1 keV energy threshold. The main SN parameters can potentially be constrained with high precision while looking at (anti-)νμ/τ. The innovative experimental approach allows for delivering important physics results also in other astroparticle physics sectors (e.g. Dark Matter) even when no SN is observed.
In this poster, the potential of this new experimental approach will be outlined, as well as complementary aspects with the currently used technologies. In addition, the experimental sensitivity and the performance of the first prototype detectors will be shown.

Poster prize

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