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135 kton Liquid Scintillator Detector

Liquid scintillator (LSc) detectors continue to play an important role in neutrino physics as demonstrated by KamLAND, Borexino, Double Chooz, Daya Bay, and Reno experiments. Advancements in electronics and signal processing have recently added flavor sensitivity and tracking for high energy neutrinos to the long list of advantages of this robust, cost effective, and well-proven technology. In particular LSc became a viable choice for mass hierarch determination with long baseline neutrino beams (CN2PY) and for measuring CP violation phase using the Daedalus scheme. The only drawback so far was the limited size. The largest proposed LSc detector (LENA) has 50 kton fiducial mass. Now we present the option for a 135 kton (fiducial) detector intended for the Pyhäsalmi mine in Finland. Regardless of tripling of the mass the performance and the physics scope of the detector would not be compromised. During decommissioning half of the total investment costs would be recuperated from the sale of the scintillator liquid (LAB).

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