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The ICARUS Experiment: latest results

ICARUS is the largest liquid Argon TPC detector ever built (~600 ton LAr mass). It smoothly operates underground at the LNGS laboratory in Gran Sasso since summer 2010, collecting data with the CNGS beam and with cosmics. Liquid argon TPCs are really “electronic bubble chambers” providing a completely uniform imaging and calorimetry with unprecedented accuracy on massive volumes. Icarus is internationally considered as a milestone towards the realization of next generation of massive detectors (~tens of ktons) for neutrino and rare event physics. In particular the experimental search for a ν_e signal in the “LSND anomaly” region in the CNGS beam, reported on a paper presently in press on EPJ C, will be here presented. This result strongly limits the window of opened options for the LSND anomaly, reducing the remaining effect to a narrow region centered around Δm^2 , $\sin^2(2\theta) = (0.5\text{eV}^2, 0.05)$ where there is an over-all agreement (90% CL) between the present ICARUS limit, the published limits of KARMEN and the published positive signals of LSND and MiniBooNE collaborations.

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