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MIST-1: A dedicated H₂⁺ Ion Source for IsoDAR

The IsoDAR experiment will have 5-sigma sensitivity to the allowed regions for eV scale sterile neutrinos, which were postulated based on the LSND and MiniBooNE low-energy excesses of events. To achieve this sensitivity, IsoDAR requires 10 mA of 60 MeV protons on target for 5 years of runtime. For compactness and cost-effectiveness, a cyclotron was chosen as driver. 10 mA is an order of magnitude above commercially available compact cyclotron currents at this energy. To overcome space-charge limitations, one of the innovations of the IsoDAR cyclotron is to accelerate H₂⁺ ions instead of H⁻ or protons. MIST-1 is a filament driven multicusp ion source, currently being commissioned for this purpose. Here, we present an overview of the IsoDAR experiment, an update on the current status, and early commissioning results of MIST-1.

Mini-abstract

IsoDAR experiment overview and status, with early commissioning results of the MIST-1 ion source.

Experiment/Collaboration

IsoDAR Collaboration

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