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Status of the Ptolemy project

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The Ptolemy experiment is designed to detect the cosmic neutrino background, believed to have formed roughly one second after the Big Bang, as predicted by the Standard Cosmological Model. Given the extremely low energy of these neutrinos, their detection is feasible through neutrino capture on beta-unstable isotopes, which do not require an energy threshold. Tritium embedded in a carbon-based nanostructure stands out as a strong candidate due to its favorable cross-section and low endpoint energy. To facilitate this detection, the Ptolemy collaboration plans to integrate a solid-state tritium source with an innovative compact electromagnetic filter based on dynamic transverse momentum cancellation. This system will be paired with a preliminary event-triggered radio-frequency preselection. To support the development of the full-scale detector, a prototype demonstrator is currently being assembled and will undergo testing at the Laboratori Nazionali del Gran Sasso (LNGS). This prototype will help address key technical challenges of the experiment and has the potential to measure the neutrino mass with a competivie sensitivity.

Collaboration you are representing

Ptolemy

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