

Design, assembly, and installation of the PROSPECT antineutrino detector

PROSPECT is a reactor antineutrino experiment uniquely designed to search for eV-scale sterile neutrinos and to precisely measure the U-235 antineutrino spectrum from the highly-enriched High Flux Isotope Reactor (HFIR). The ~ 4 ton segmented detector is positioned 7-9 m from the reactor core with minimal overburden and uses ^6Li -loaded liquid scintillator to identify and localize inverse beta decay events. The active detector is surrounded by layered shielding to reject backgrounds. Each of the 154 segments contains ~ 25 l of scintillator, is made from low-mass optical reflectors, and readout by a photomultiplier tube module on both ends. An integrated optical and radioactive source calibration system allows the precise characterization of the response of each segment. This poster will report the details of the design, assembly, and installation of the PROSPECT antineutrino detector.

Authorship annotation

for the PROSPECT collaboration

Session and Location

Monday Session, Poster Wall #194 (Ballroom)

Poster included in proceedings:

yes

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Track Classification: Poster (participating in poster prize competition)