# Neutron source-based event reconstruction in JUNO

*Friday, 21 June 2024 17:30 (2 hours)*

The Jiangmen Underground Neutrino Observatory (JUNO) will be a 20-kiloton liquid scintillator detector, currently under construction in southern China. JUNO will be equipped with 17,612 20-inch photomultiplier tubes (PMTs) and 25,600 3-inch PMTs and aims to determine the neutrino mass ordering as the primary physics target by precisely measuring the energy spectrum of the reactor electron antineutrinos. For this physics objective, a high-quality signal and background separation as well as an optimized energy resolution are indispensable, and the event reconstruction is one of the key components to carry them out. We will present an event reconstruction algorithm that identifies the event vertex position, particle type, and energy. The tuning of this algorithm does not rely on simulation samples but utilizes the forthcoming calibration data, especially radioactive neutron source and cosmogenic spallation neutron events. This poster will cover the development scheme of the algorithm based on those calibration events, and expected performances of the vertex reconstruction, particle identification with the traditional pulse-shape discrimination technique, and energy reconstruction evaluated using the JUNO detector simulation.

## Poster prize

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