Special Issue

Near Detectors for Neutrino Oscillation Experiments

Message from the Guest Editors

Long-baseline neutrino oscillation (LBNO) experiments have provided key insights for a deeper understanding of neutrino physics. A neutrino beam is produced using a proton accelerator and the oscillated neutrino spectrum is measured at a distance L from the production point. To minimize systematic uncertainties, it is crucial to characterize the neutrino fluxes and neutrino cross-sections before the oscillations. This is performed by using near detectors, installed close to the production point, that measure the neutrino spectra unaffected by neutrino oscillations, and by using beam monitors, which directly measure particles associated with neutrino production. Contributions are expected to address, but are not limited to, the following areas:

- Detector R&D studies
- Novel detector designs
- Novel event reconstruction algorithms
- Test results

Keywords:

- long-baseline neutrino oscillation
- near detector
- LBNO
- neutrino beam
- particle identification
- liquid argon TPCs
- gas TPCs

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The realization of dedicated instrumentation has always been a collateral aspect of experimental research. In addition, many groups dedicate efforts and resources solely to the development of new devices, sensors, equipment and large infrastructure, theoretical and numerical studies, and novel experimental methodologies. With *Instruments* we wish to address both established and emerging communities, also to favor the creation of innovative trans-disciplinary approaches. We see *Instruments* as an exciting high-impact journal that will soon hold a leading position in disseminating cutting edge scientific and technological research.

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