38th INTERNATIONAL CONFERENCE ON HIGH ENERGY PHYSICS
AUGUST 3 - 10, 2016
CHICAGO

Contribution ID: **1628** Type: **Poster**

Solar, supernova, atmospheric and geo neutrino studies using JUNO detector

Monday 8 August 2016 18:30 (2 hours)

Aside from its primary purpose of shedding light on the mass hierarchy (MH) using reactor anti-neutrinos, the JUNO experiment in Jiangmen (China) will also contribute to a series of measurements on neutrinos from non-reactor sources.
In this poster we will review JUNO's goals in the realms of Supernova (SN), atmospheric, solar and geo-neutrinos; present the related experimental issues and provide the current estimates of its potential.
For a typical galactic SN at a distance of 10 kpc, JUNO will record about 5000 events from inverse beta decay, 2000 events from elastic neutrino-proton scattering, 300 events from neutrino-electron scattering, and the charged current and neutral current interactions on the 12C nuclei. With a dedicated detector and real time event selection design, JUNO is expected to contribute to characterize the SN explosion mechanism. In addition, observation of the diffuse supernova neutrino background is also plausible in the JUNO framework. For atmospheric neutrinos, JUNO should be able to detect νe and νμ charged current events. The muon angular accuracy may be better than 1° for long muon tracks. Optimistically, a determination of the MH could be achieved at the 1.8σ (2.6σ) level after 10 (20) years of data taking. JUNO will also study solar neutrinos from 7Be and 8B, at low (˜1 MeV) and higher energies respectively, to improve our understanding of the matter effects on the oscillation mechanism and of the solar metallicity. The challenges of the radioactive and cosmogenic backgrounds, together with the expected performances for two benchmark scintillator radio-purities, will be shown. The flux of geo-neutrinos gives us an insight on the Earth composition and formation. We will show how the increased sample size given by JUNO's large sensitive mass of 20 KTon liquid scintillator will provide data to answer to several geological questions among which the U/Th ratio and mantle measurements.

Primary authors: SALAMANNA, Giuseppe (Roma Tre Universita Degli Studi (IT)); HAN, Ran (North China Electric Power University); Dr GUO, Wan-Lei ([On behalf of the JUNO Collaboration] Institute of High Energy Physics, Chinese Academy of Sciences); LI, Yufeng (Institute of High Energy Physics, Chinese Academy of Sciences)

Presenter: SALAMANNA, Giuseppe (Roma Tre Universita Degli Studi (IT))

Session Classification: Poster Session

Track Classification: Neutrino Physics