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The impact of the carbon-14 contamination in liquid scintillator on the sensitivity to the neutrino mass hierarchy determination in the JUNO experiment with Global Neutrino Analysis framework

JUNO is the reactor antineutrino experiment utilizing 20 kilotons liquid scintillator detector. The main goal of the experiment is to provide a determination of the neutrino mass hierarchy at the confidence level of 3-4 standard deviations. The carbon-14 is the natural radioactive isotope that is present in the liquid scintillator. A study of the degradation of the JUNO sensitivity to the neutrino mass hierarchy determination due to carbon-14 contamination was performed using Global Neutrino Analysis framework – a software tool under development at JINR. This study leads to a requirement of a possible contamination of carbon-14 in the liquid scintillator.

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