



## Poster session 3 – Wednesday 6 July

### P3.065 Omnibus experiment: CPT and CP violation with sterile neutrinos

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Determination of the phase of the CP violation in the leptonic sector is the main goal of the two largest and most ambitious neutrino experiments proposed so far: LAGUNA-LBNO and DUNE. Discovery of CPT violation would be of even more fundamental importance but there are currently no coordinated plans to search for it. Equally significant is verification of the sterile neutrino hypothesis and, if confirmed, determination of the relevant oscillation parameters. We propose to probe both the CPT and CP violation together with the search for sterile neutrinos in one do-it-all experiment. This omnibus experiment would utilize neutrino oscillometry with large scintillator detectors like LENA, JUNO or RENO-50 and radioactive sources similar to the ones used by the GALLEX experiment. Our calculations indicate that such an experiment is realistic and could be performed in parallel to the main research plan for JUNO, LENA, or RENO-50. Assuming as the starting point the values of the oscillation parameters indicated by the current global fit (in  $3 + 1$  scenario) and requiring at least 5 sigma confidence level, we estimate that we would be able to detect CPT mass anomalies of the order of 1% or larger. A very strong argument to consider such an experiment already now is the fact that construction of JUNO has started (in January 2015) and the expected commissioning date is 2020. It would naturally be naïve to expect that a single experiment would answer all the key questions of neutrino physics. However, since the 20 kton liquid scintillator detector is now firmly on the horizon and is likely to deliver the first data well ahead of the long baseline experiments, we propose to widen its research program to include the omnibus approach.