



Contribution ID: 124

Type: **not specified**

Neutrino Beam from Protvino to KM3NeT/ORCA

The Protvino accelerator facility located in the Moscow region, Russia, is in a good position to enable a rich experimental research program in the field of neutrino physics. Of particular interest is the possibility to direct a neutrino beam from Protvino towards the KM3NeT/ORCA detector which is currently under construction in the Mediterranean sea 40 km offshore Toulon, France. Such an experiment, nicknamed P2O (Protvino-to-ORCA), would yield an unparalleled sensitivity to matter effects in the Earth, allowing to determine the neutrino mass ordering with a high level of certainty due to its baseline of 2595 km after only few years of running time at a modest beam intensity up to 100 kW. A second phase of the experiment, comprising a further intensity upgrade of the accelerator complex and a significant densification of the ORCA detector would allow for a competitive and complementary measurement of the leptonic CP-violating Dirac phase with a Mton detector but avoiding underground excavation costs. The initial composition and energy spectrum of the neutrino beam would need to be monitored by a near detector, to be constructed several hundred meters downstream from the proton beam target. The same neutrino beam and near detector set-up would also allow for neutrino-nuclei cross section measurements to be conducted.

Primary author: BRUNNER, Juergen (CPPM)

Track Classification: Neutrino physics (accelerator and non-accelerator)