Contribution ID: **90** Type: **Abstract for a Poster**

Water-Cherenkov Test Experiment (WCTE) and beam tests of July 2023

The Water-Cherenkov Test Experiment (WCTE) is a prototype water Cherenkov detector which will be placed in the T9 beam area at CERN, operated with a low momentum (200-1200 MeV/c) $\pi^{\pm}$, $\mu^{\pm}$, $e^{\pm}$ and p^{+} particle flux. The main purpose of this experiment is to prove the new technologies that are being developed for the next-generation water-Cherenkov experiments, especially for the far detector and intermediate (IWCD) detectors of the Hyper-Kamiokande project, along with properly modeling the detector response and studying physical processes such as Cherenkov light profile produced by secondary particles, charged pion hadronic scattering or secondary neutron production and tagging, the latter chiefly during the phase where gadolinium (Gd) will be loaded with the ultra-pure water in the $\sim$40 tonne detector tank.

The design and construction of the stainless steel cylinder, the 102 multi-photomultipliers (mPMTs), each consisting of 19 PMTs to detect the signal emitted by the produced particles after the interaction of the incoming particle with the water filling the tank, and other physical parts of the detector, as well as simulation packages and analysis strategy, are currently in their final stages of development, just after beam testing took place last July. During this period, a second configuration was tested, using bremsstrahlung γ from a radiator as a gamma source, in order to study detector response and the ability to separate γ from electrons. This set up has a permanent magnet to bend the initial e^{+}/e^{-} so it can be measured in a hodoscope to determine the energy of the gammas.

Data taking period with WCTE is scheduled for summer 2024, and the WCTE collaboration is working towards the start of assembly for the WCTE detector in November 2023.

Primary author: RAMOS, Elena (Donostia International Physics Center (DIPC))

Presenter: RAMOS, Elena (Donostia International Physics Center (DIPC))

Session Classification: Poster Session and Aperitif