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## Demonstration of a Water Cherenkov Optical Time-Projection Chamber (OTPC)

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We describe a prototype water-based optical time projection chamber (OTPC), in which tracks of relativistic charged particles are reconstructed using the emitted Cherenkov radiation. The detector is a vertical cylindrical  $\sim 40$  kg water mass that is instrumented with a combination of  $2 \times 2$  in<sup>2</sup> microchannel plate (MCP) photodetectors and  $3 \times 3$  in<sup>2</sup> mirrors on the sides, in a stereo configuration.

For each MCP, a mirror is mounted on the opposite side of the cylinder allowing for the detection of both direct and reflected photons. Each MCP photomultiplier has 60 channels of waveform digitizing readout in which the waveforms are read out on a transmission line anode. The system's time ( $\sim 50$  ps) and spatial ( $\sim 1$  mm) resolution tagging of

single photons allow for precision track reconstruction using both the prompt and reflected light. Particle tracks are reconstructed by fitting the vertical and azimuth photon time projection data, extracting 3D tracks and the Cherenkov angle. First results from cosmic ray muons will be presented.

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