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A lab scale time projection chamber (TPC) for testing the pixelated charge read out using the novel Q-Pix concept in gas and liquid argon environment

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We describe the design and operations of a lab scale time projection chamber (TPC) which is being developed to test the novel pixelated charge read out scheme, Q-Pix. The aim is to demonstrate the capability of the Q-Pix readout to reconstruct the particle tracks in ultra high pure (UHP) Argon (Ar) in both gas and liquid phase. The TPC is equipped with an Hamamatsu R8520 photo multiplier tube (PMT) below the cathode plane that allows the detection of the scintillation light. The front face of the PMT and the Teflon cylinder which holds the field cage is coated with TetraPhenyl Butadiene (TPB) that allows the detection of the VUV scintillation in Ar. For the testing and commissioning of the TPC we installed an alpha source (Am-241) and a gamma source (Co-60) near the field cages. This poster will present first data from the TPC in both gas and liquid argon and show how the performance of the purification system affects the lifetime of the slow component of the liquid Ar scintillation.

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