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Development and Testing of a High Voltage Feedthrough for Noble Liquid TPCs ARTIN TEYMOURIAN, YIXIONG MENG, EMILIJA PANTIC, HANGUO WANG, UCLA — Noble liquid Time Projection Chambers (TPCs) are used in many experiments for the detection of WIMPs and neutrinos. In a TPC, an incoming particle deposits energy in the target material (liquid argon or liquid xenon) and creates scintillation light, which is detected by photodetectors. The deposited energy also ionizes some of the atoms of the target material, and the ionized electrons are drifted toward a gas phase or charge readout wires as a secondary signal. The TPCs require electric fields on the order of 1 kV/cm in order to drift the ionized electrons. For this reason, larger TPCs will require higher voltages to maintain the same electric field. The voltage required for the electric field is provided by a high voltage feedthrough. In this talk, I will present the development and testing of a high voltage feedthrough at UCLA capable of exceeding 100 kV in liquid argon and liquid xenon TPCs. This feedthrough design will be used in the future XENON1Ton, DarkSide50, and LBNE detectors. The feedthrough must withstand the high voltage and should be vacuum tight. In the case of dark matter detectors, the feedthrough must also be constructed with materials that contain ultra-low intrinsic radioactivity.

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