

MOTION: a facility for high voltage in liquid xenon

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MOTION is a time projection chamber with 80 kg of liquid xenon (LXe), serving as a testing platform for high-voltage (HV) delivery of around -200 kV and stability in LXe for next-generation dark matter detectors

Subsystems

Coolant supply from nitrogen tower

Xenon gas condenser

LXe continuous purification

Imaging of LXe volume

Emergency vessels

Live process monitoring

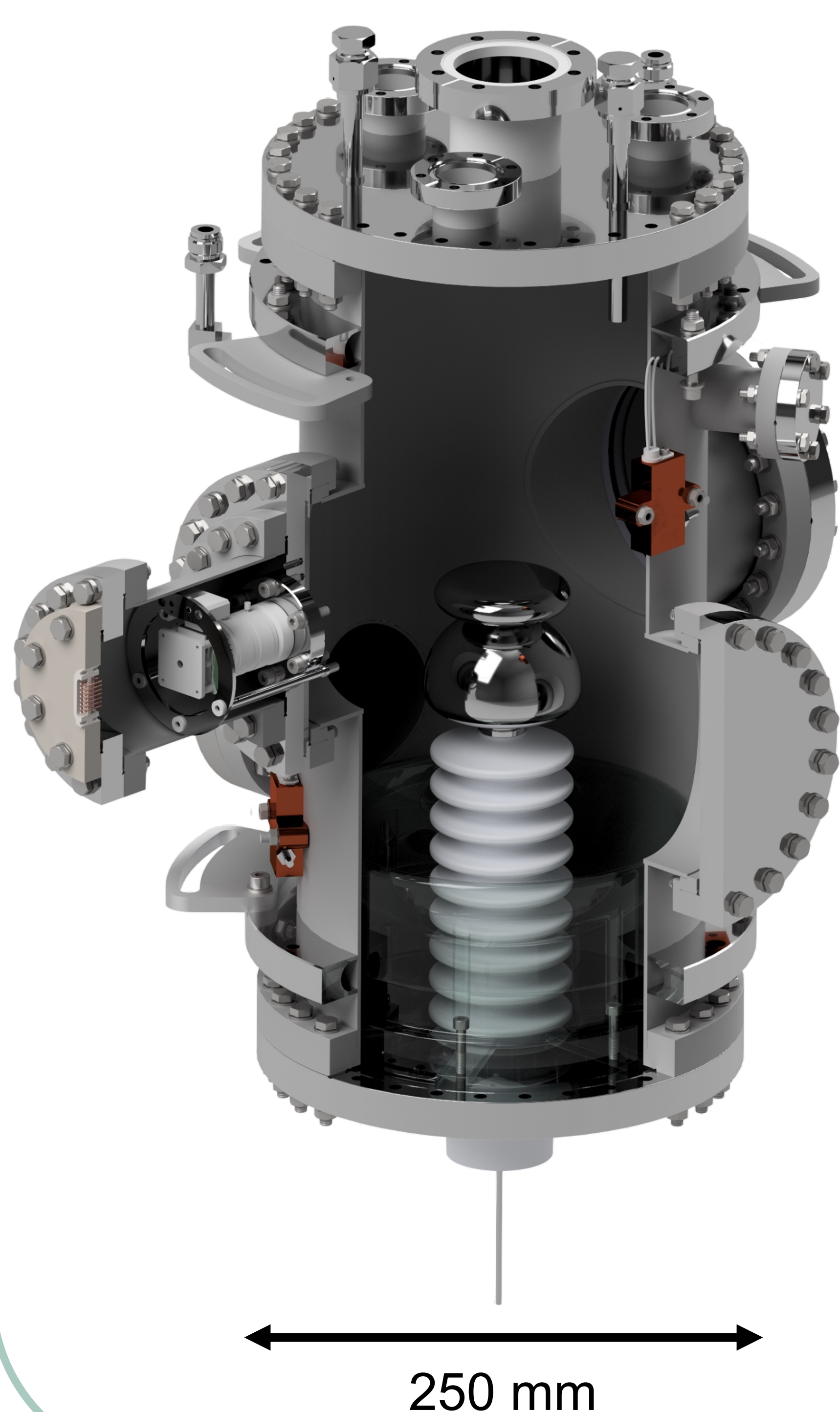
Goals

HV delivery development in LXe and vacuum

Monitoring of systematics: effects of purity, stressed surface and pressure

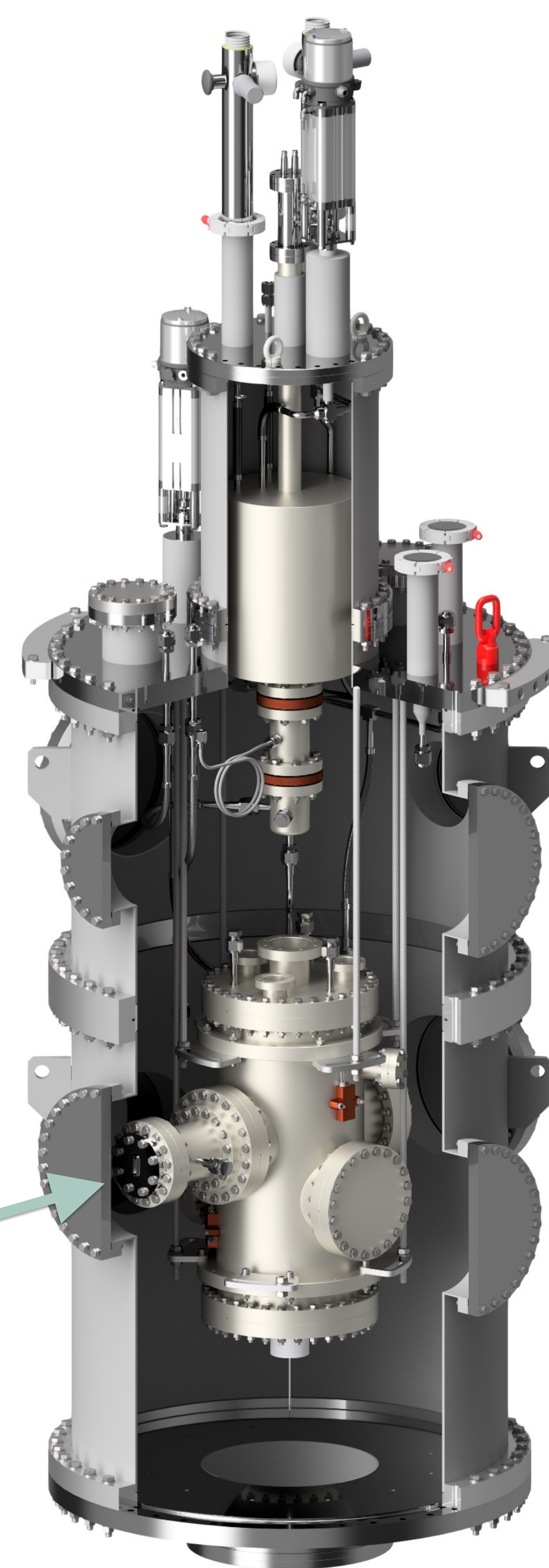
Studies with tritium calibration and removal

Inner Vessel



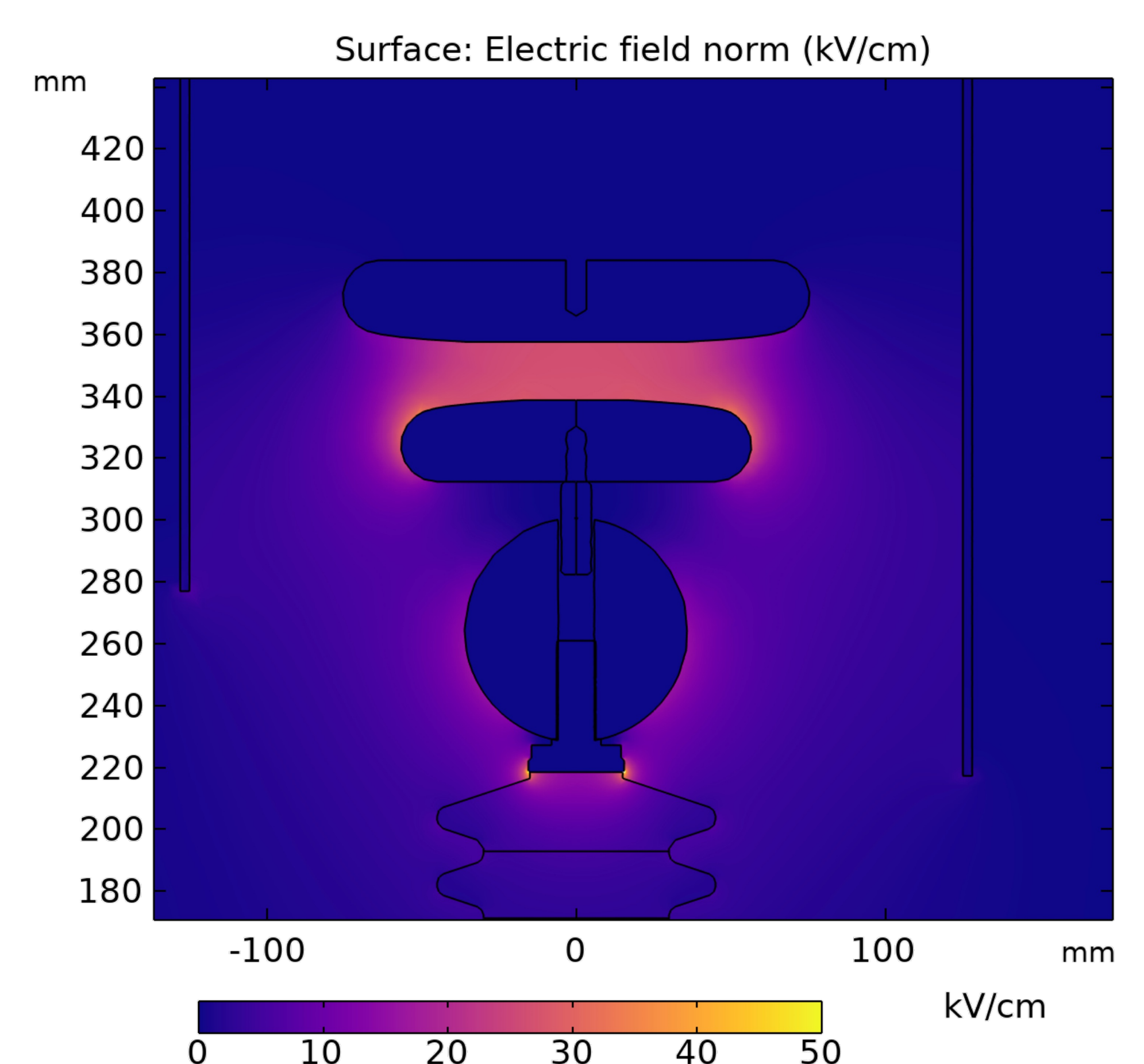
520 mm

250 mm



The outer vessel allows for instrumentation of components from all sides of the TPC

Simulations



Numerical simulations on the electric field for the optimisation of components submerged inside the LXe volume