

Setup for the measurement of Mega-Cell (VD-Xarapuca) PDE at CIEMAT

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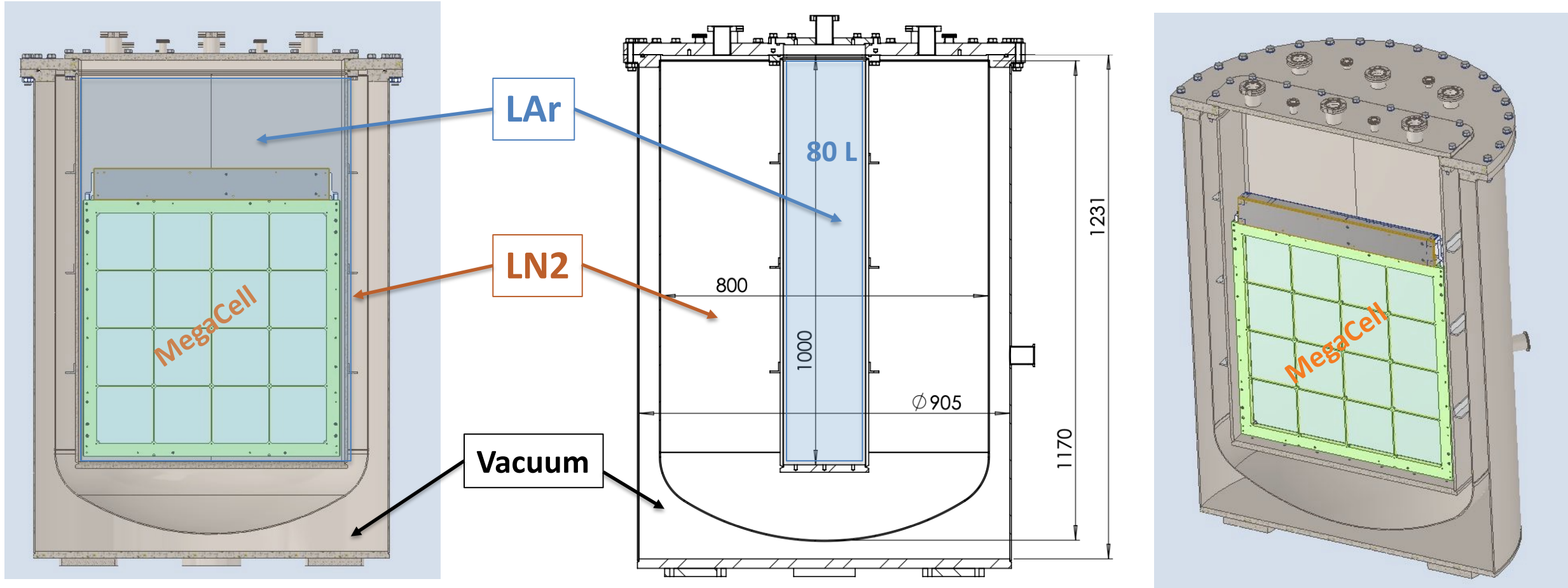
Cryogenic Lab



500 L Vessel

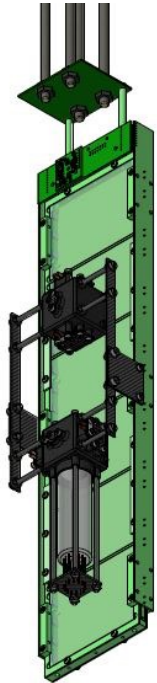
Vessel system

GAr 99.9999% is liquified with LN₂ at 2.7 bar



Setup

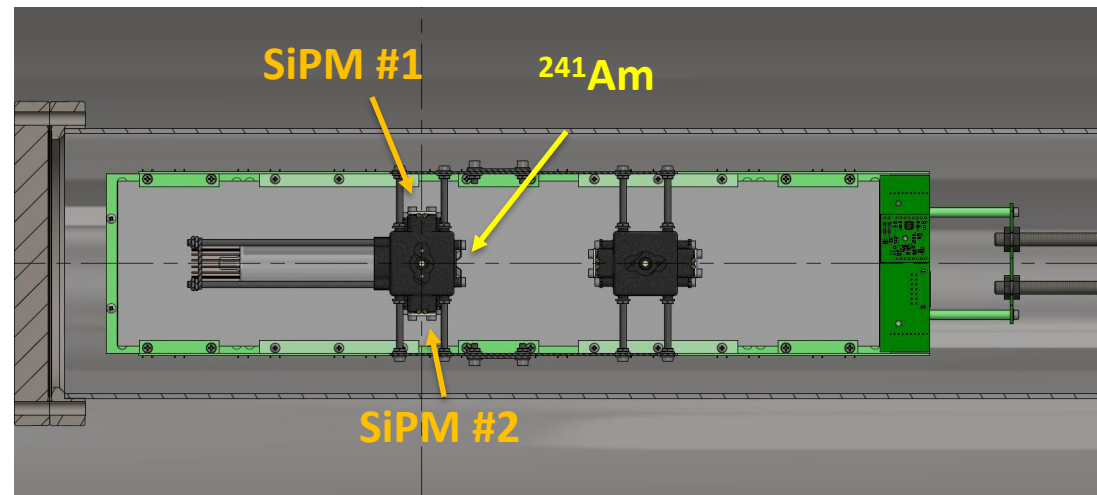
- The efficiency is measured in LAr with the scintillation light from an ^{241}Am alpha source. Calibrated VUV sensitive SiPMs could be used as reference.



Previous Super-Cell (HD-XA) PDE measurement

α -particle deposits its energy inside a small black box with a hole facing the Super-Cell (the rest is covered with a black sheet).

The α -source and the ref. SiPM's are symmetrically placed with respect to the SC

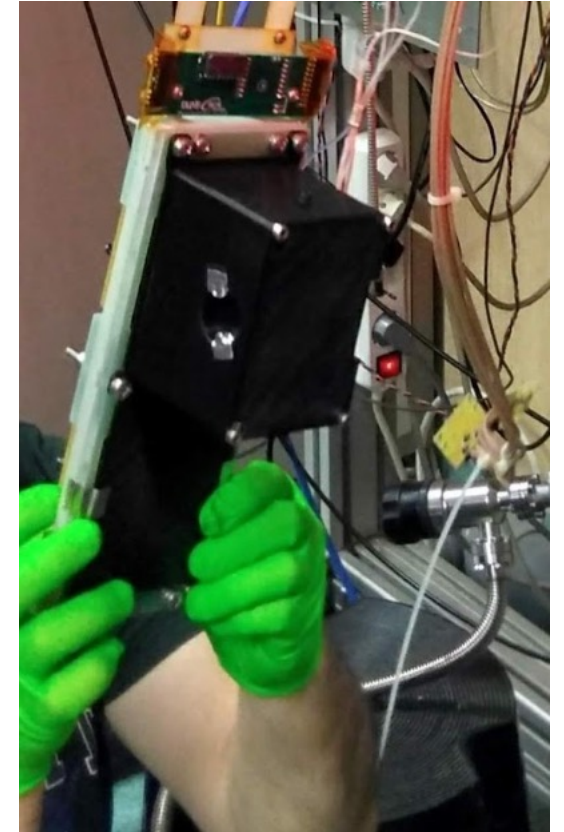


Setup

- The efficiency is measured in LAr with the scintillation light from an ^{241}Am alpha source. Calibrated VUV sensitive SiPMs could be used as reference.

The system will be improved:

- New box design (already used in XA-SBND PDE measurement)
 - A complete filter is exposed to the α -source inside the box
 - 4 VUV SiPM's (to reduce systematic errors)



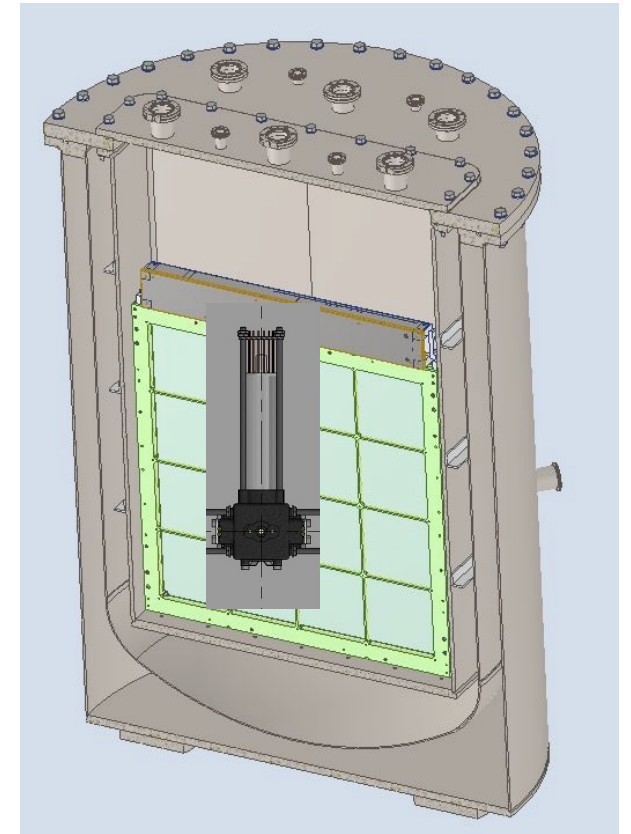
Setup

- The efficiency is measured in LAr with the scintillation light from an ^{241}Am alpha source. Calibrated VUV sensitive SiPMs could be used as reference.

The system will be improved:

- New box design (already used in XA-SBND PDE measurement)
 - A complete filter is exposed to the α -source inside the box
 - 4 VUV SiPM's (to reduce systematic errors)
- Support for moving the α -source along the XA

The setup also includes an optical fibre connected to different wavelength LED's for calibration



Conclusions

- The Cryogenic Lab is ready for XA-VD (Mega-Cell) PDE measurement
- A new system of concentric vessels has been designed and manufactured (similar to the CERN test-bench), with a “cassette” as LAr recipient.
- A new support (black box) for the α -source and ref. SiPM's is being designed.
- We can start receiving Mega-Cell components for assembly at CIEMAT or a complete membrane XA from ProtoDUNE-VD