

LXe R&D

Info update

Funding

2022 – 2024: CERN/FIS-INS/0026/2021 -- FCT funding for participation in RD51 - LIP/UC/UA – 70 k€ / 2 years

2022 – 2024: RD51 Common Fund – LIP/UC/WIS – 36CHF / 2 years

Future funding opportunities:

We are participating in the **DRD1** (Gas Detectors) and **DRD2** (Liquid Detectors) Collaborations with:

- Development of novel readout techniques (**Floating Hole Multiplier, novel Micropattern structures for electroluminescence in liquid xenon**)
- LXe physics (**surface studies, electroluminescence in the liquid phase**)

Submitting proposal to FCT/CERN together with 3 other groups from LIP, 1 group from UA and 1 from UC (200k€)

Members (PhDs):

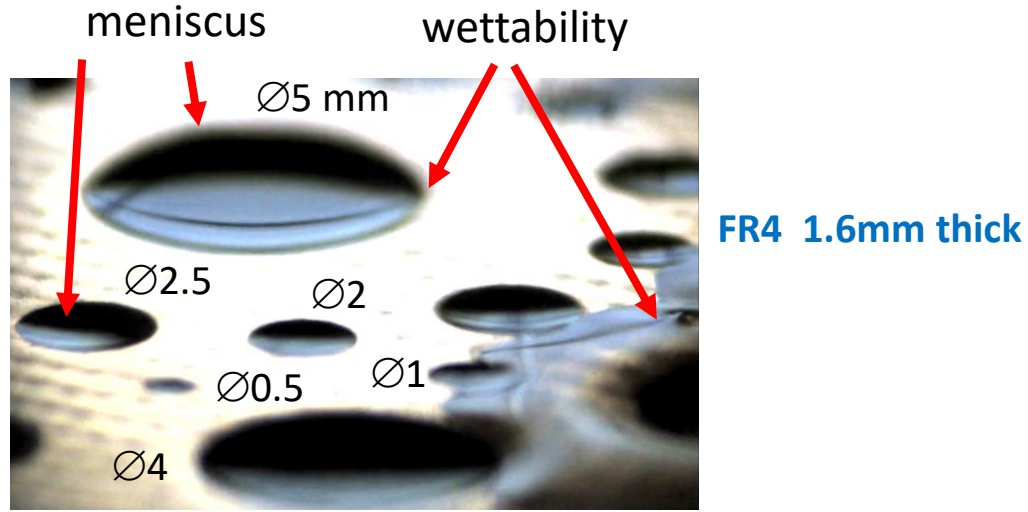
Vitaly Chepel (full time)

Vladimir Solovov (0.2 FTE)

Francisco Neves (0.15 FTE)

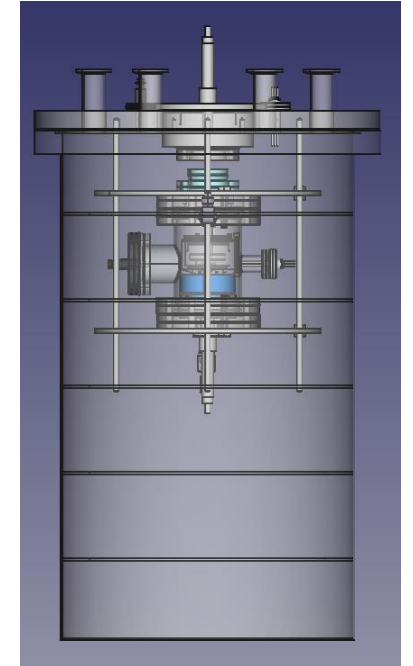
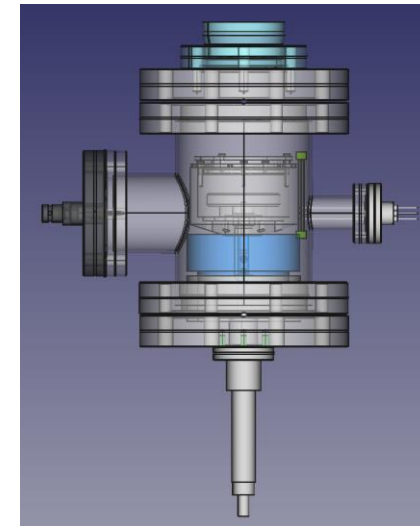
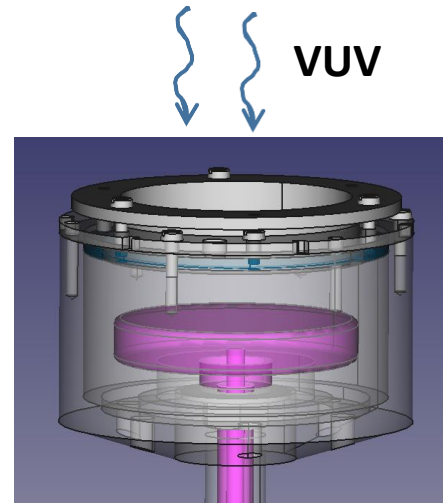
Current activities:

1. Floating Hole Multiplier – studying thicker plates:

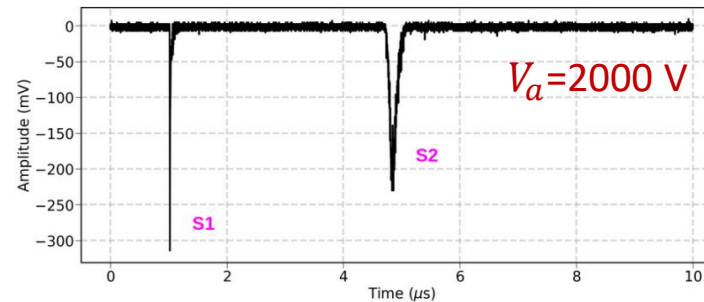
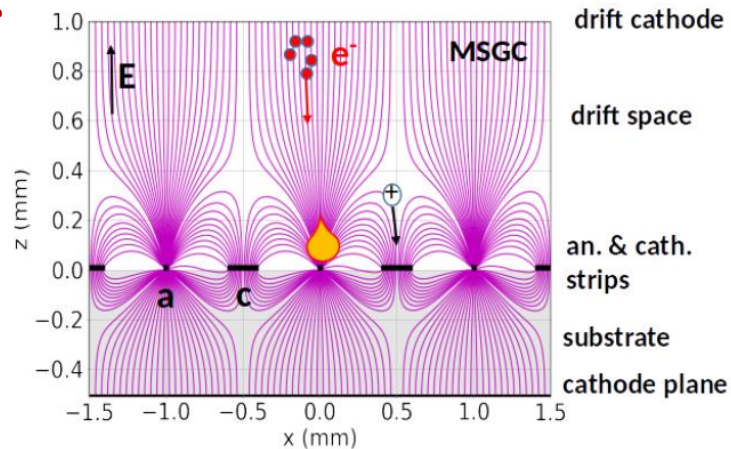


2. Measurements of electron extraction efficiency from LXe:

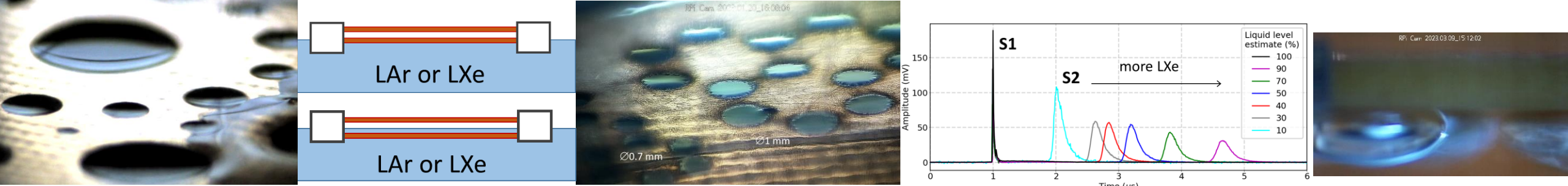
1. Studying sources of low energy electrons – VUV lamp, VUV LEDs + photoelectric emission from different materials
2. Setup development – design almost ready



3. Electroluminescence of LXe with Microstrip Plate:



36 ± 3 VUV phot/e



SWOT Analysis

Strength

Highly qualified members with many years of experience of R&D in the field of detector development.

Weaknesses

Limited availability of human resources. Heavy involvement of the group members in other activities and projects.

Opportunities

The weaknesses overcome, there will be an opportunity for sound contributions to the development of liquid xenon detectors and better understanding of the underlying physics, as well as to the development of novel technologies for the next generation of large scale liquid noble gas detectors for rare events, in particular.

Threats

Funding irregularities and permanent uncertainty. Urgent investment needed to renew the experimental base (vacuum pumps, analogue electronics)