

LINAC4 source test stand

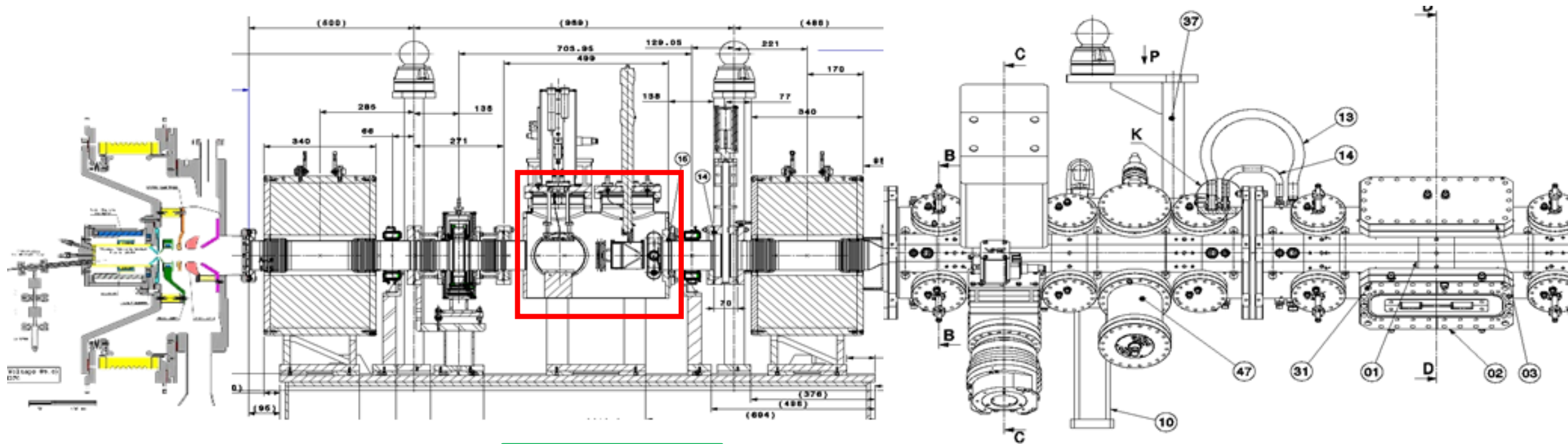
Presentation for the WP10 working group

Spare RFQ project

Source test stand : 45 kV

- Located in building 152, under the responsibility of ABP/HSL, it is dedicated to testing H- ion sources for linac4 operation (priority), for studies towards next generation source and for other experiments (diagnostics, irradiations etc).
- It was/will be used for the measurement of the RFQ accelerating from 45keV to 3MeV
- It had and will have multiple configurations
- **THANKS to Mike o'Neil, Francesco di Lorenzo, Sebastian Bertolo, Cristiano Mastrostefano and Julien Thiboud**

Most used configuration : replica of the low energy beam transport in LINAC4 tunnelling

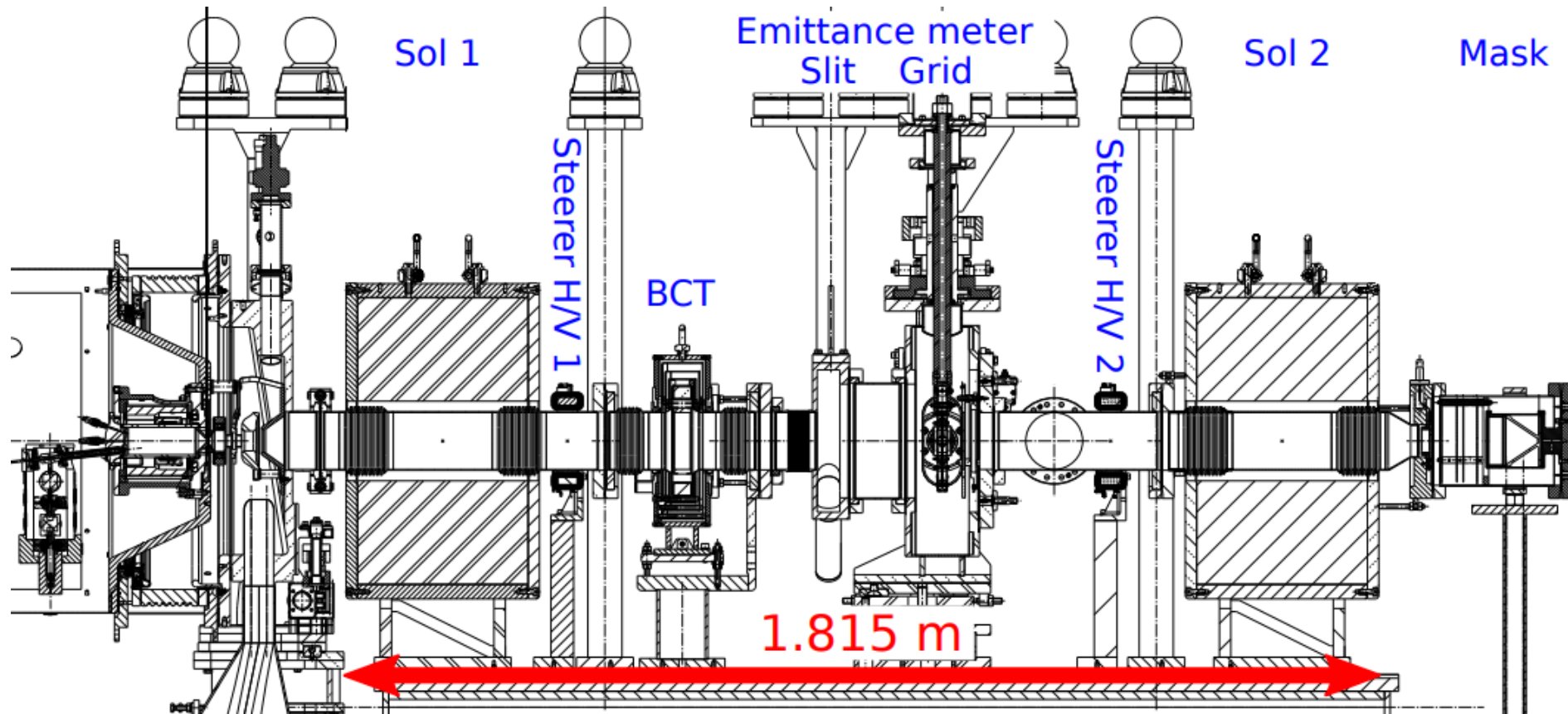


Source :45kV

2 Steeres

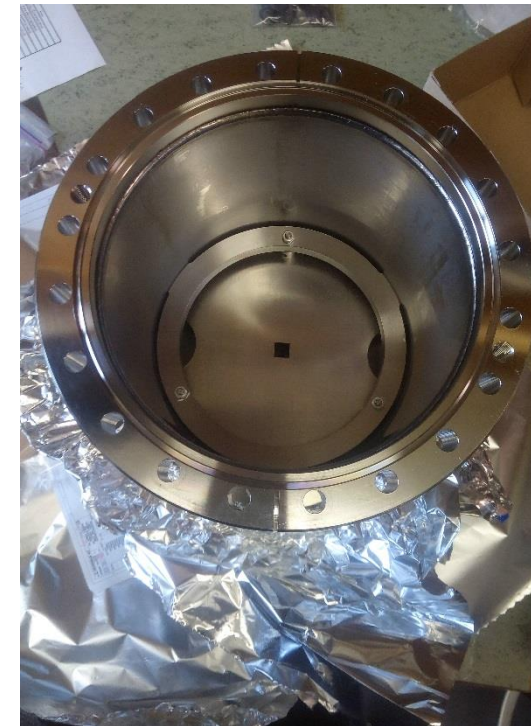
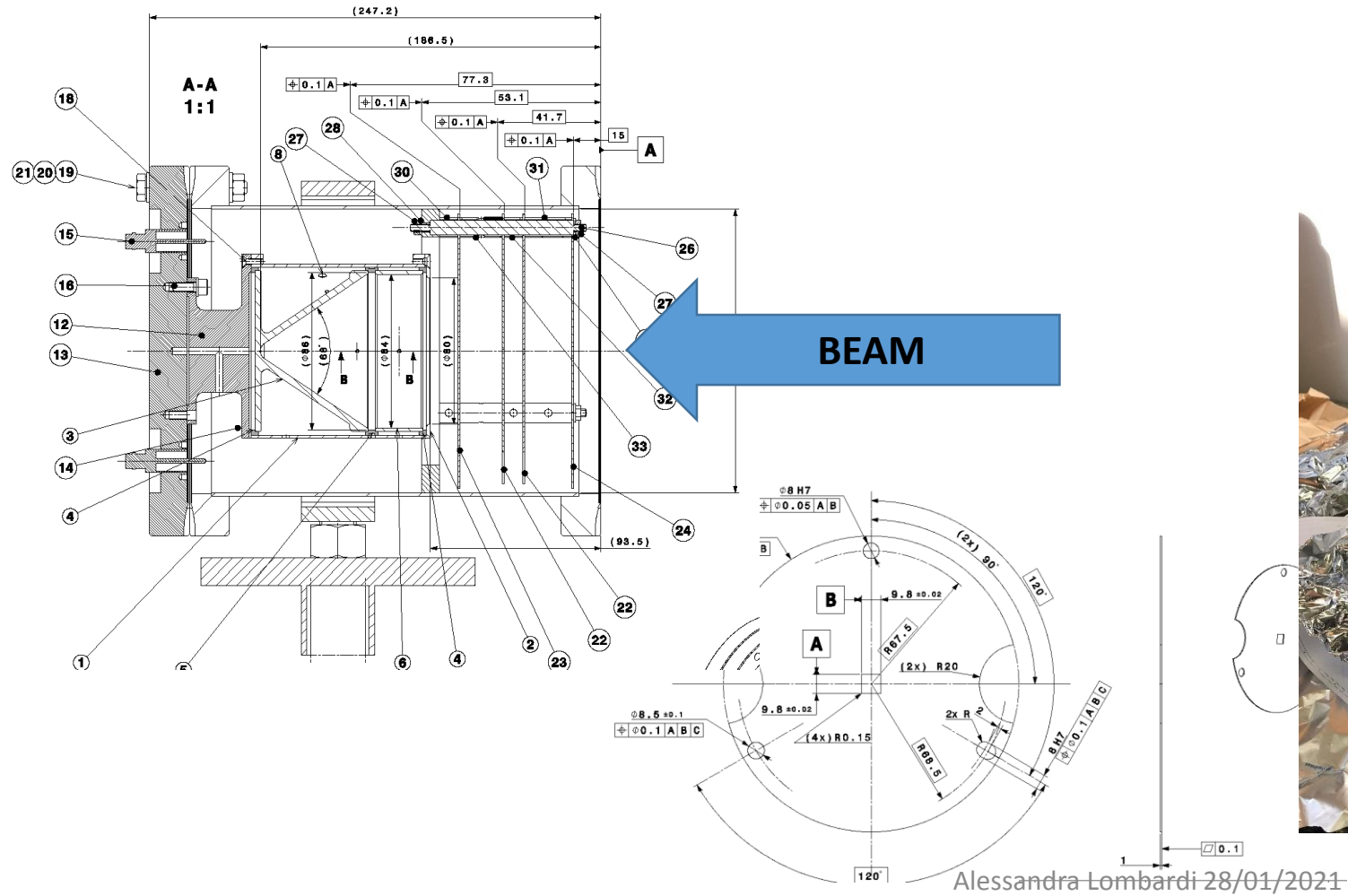
2 Solenoids

In the test stand we have the same active elements but more diagnostics



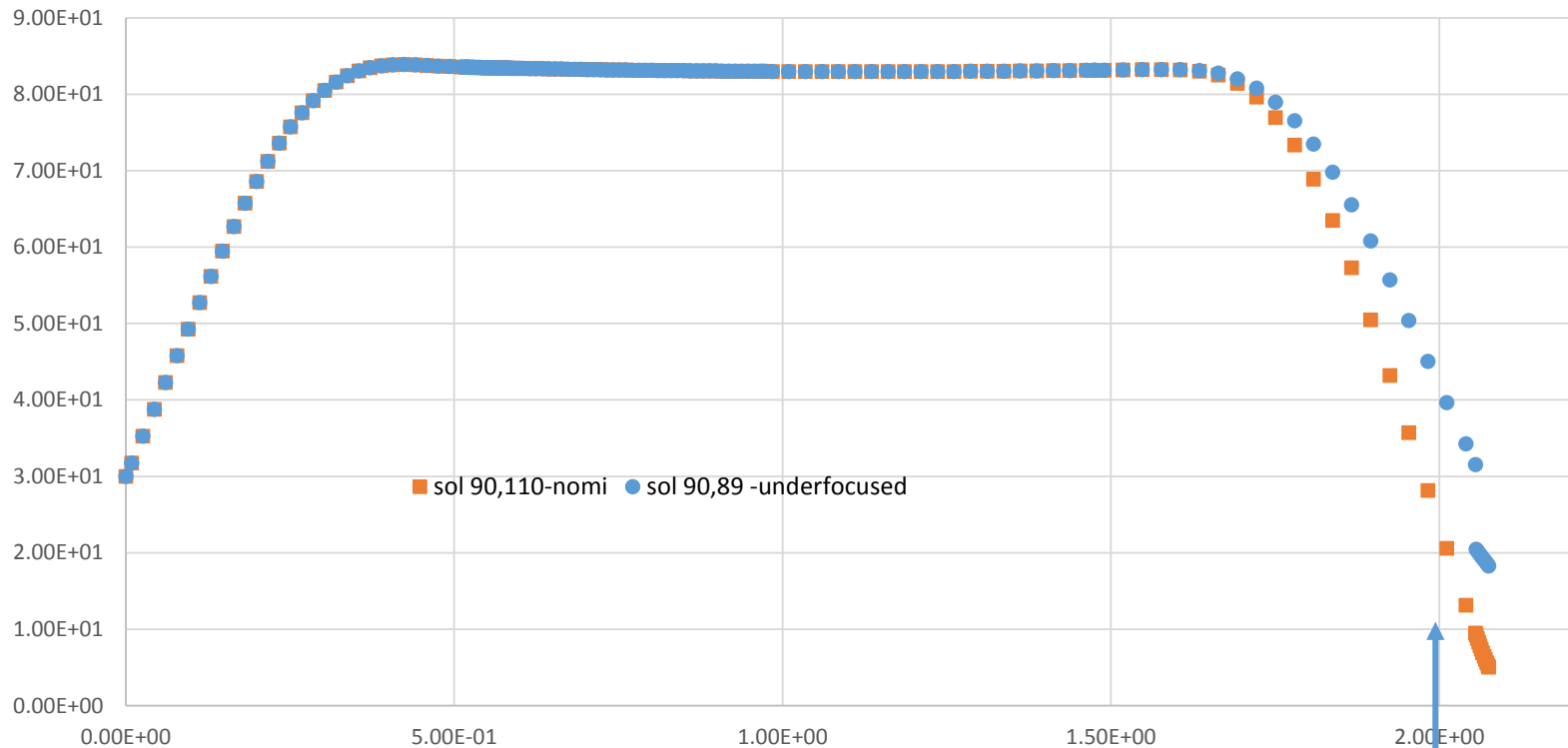
The mask in practice

A set of four plates with square holes, distances given by shims and a Faraday cup.



Nominal beam dynamics

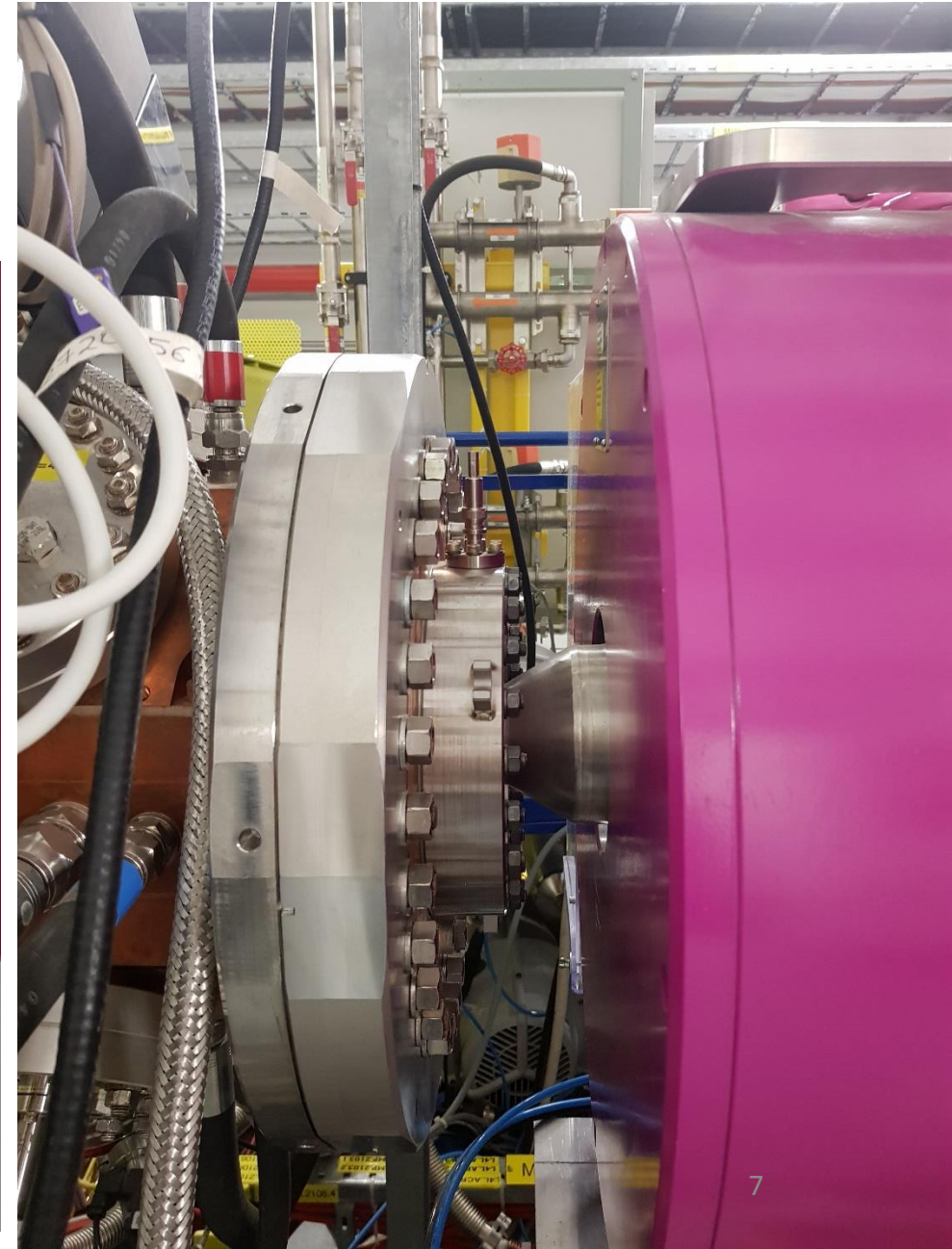
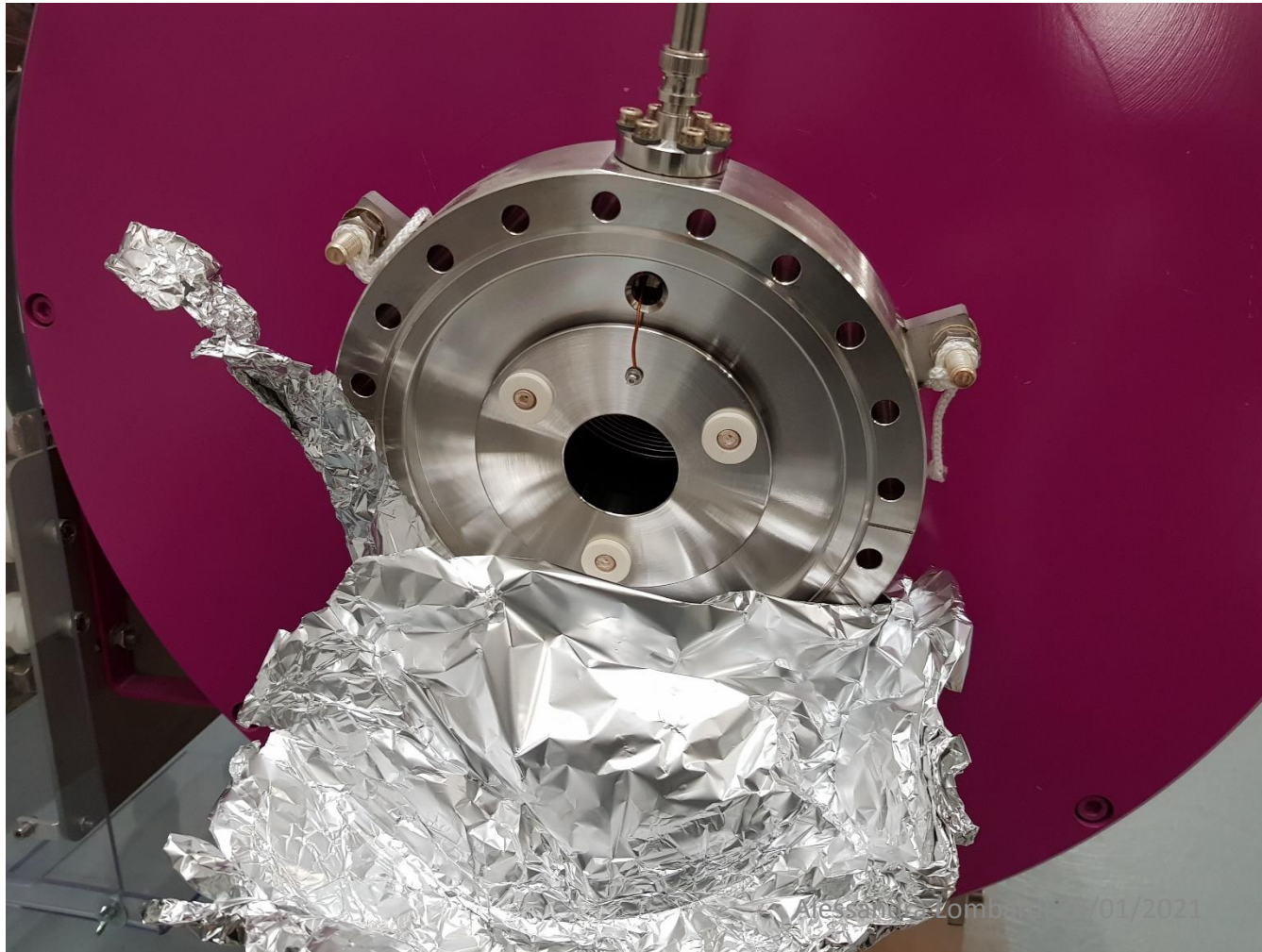
4 rms beam radius mm vs distance in the LEBT m



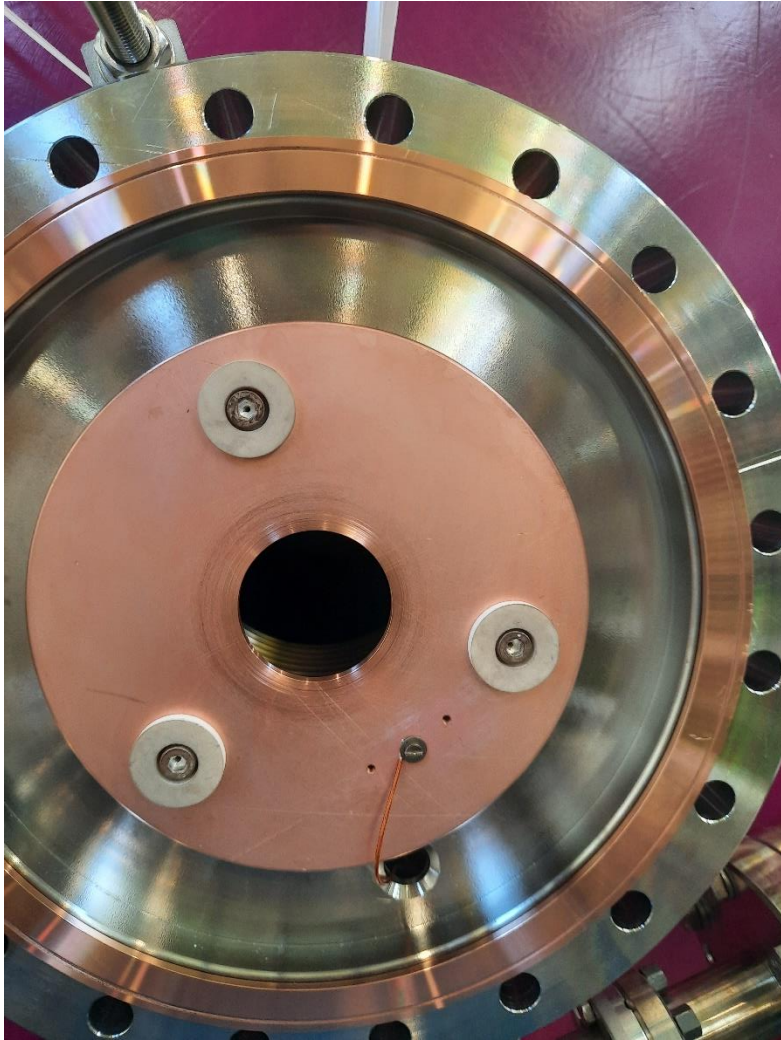
Beam size at the target can be changed from 2-3 mm to 2-3 cm

	Position mm	Aperture diameter mm
Source ground	-195	8mm
solenoid	215	100mm
steerer	434	100mm
Pre-chopper	936	100mm
steerer	1340	100mm
Sector valve	1443	
solenoid	1690	100mm
Transition and collimator	1935	To 40 mm or less
Flange	1955	
Target to irradiate2021	1970	

Nomi configuration just before the target



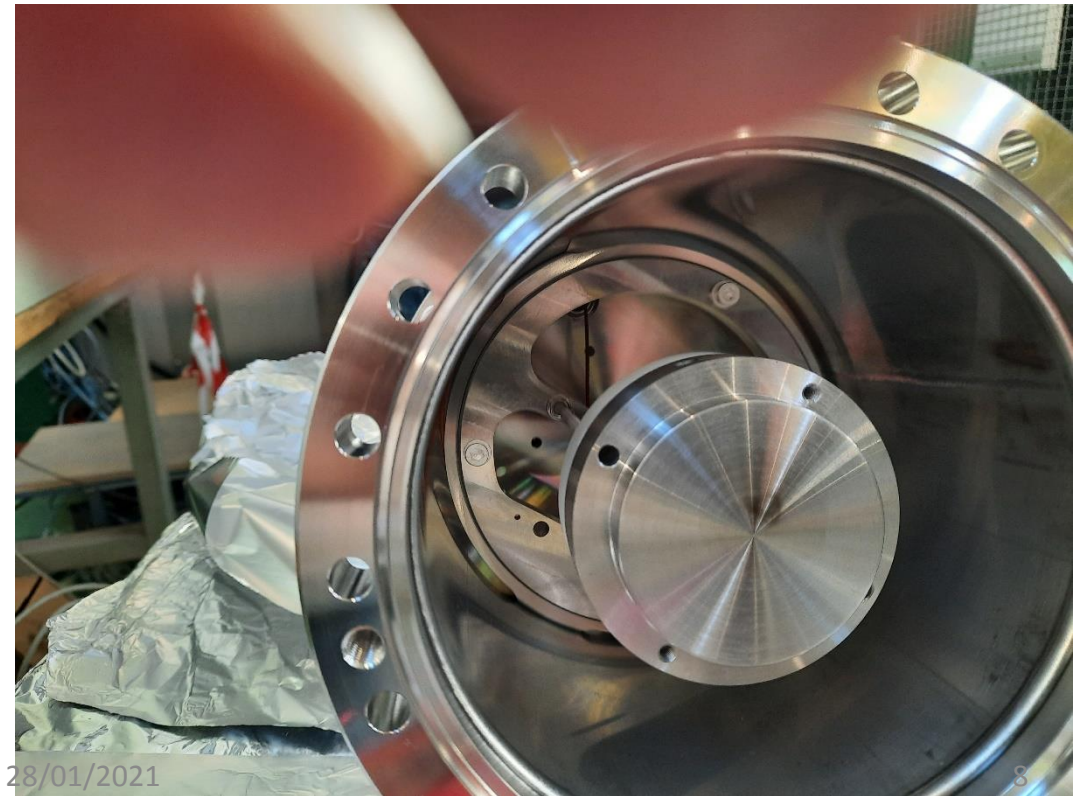
With collimator



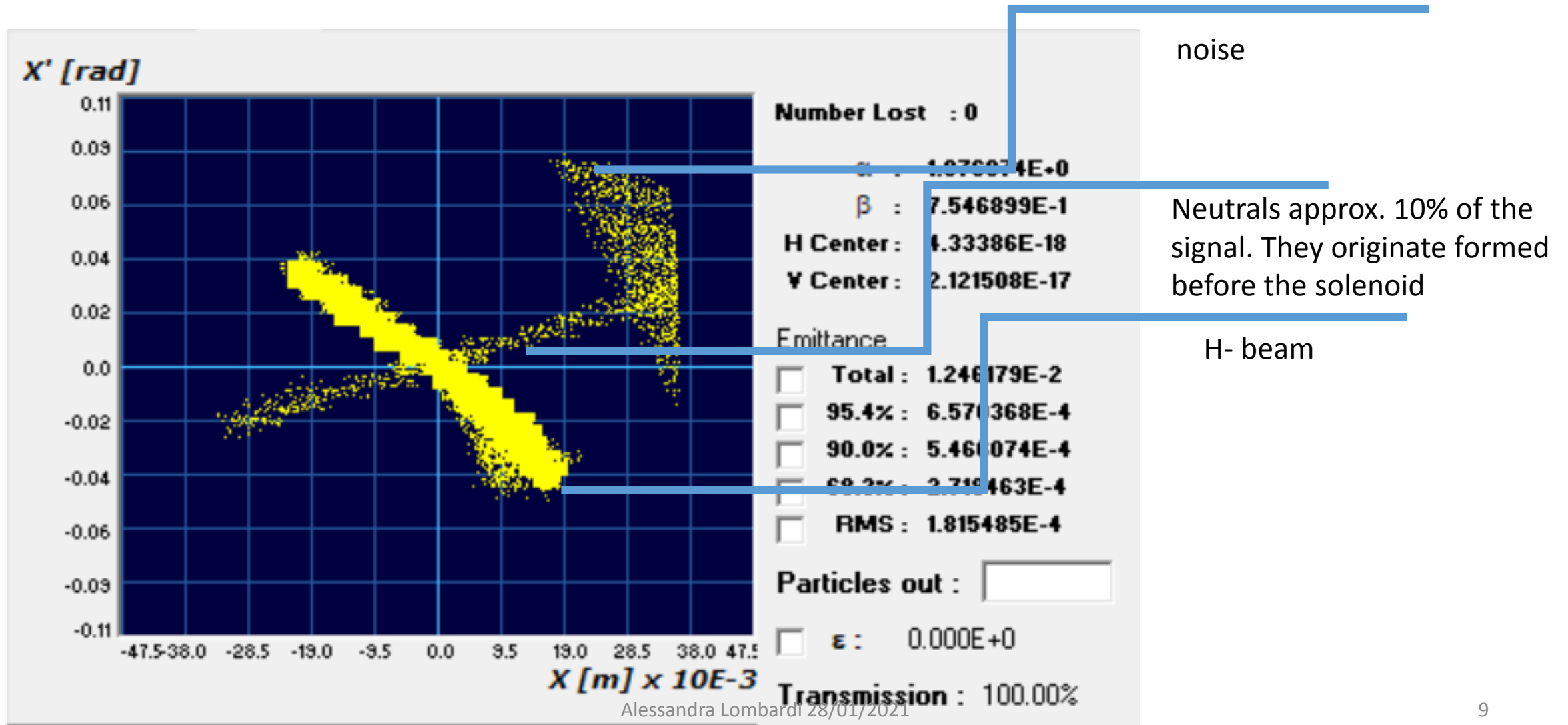
Easy mounting

Aperture can be tailored to needs

We can record the current that falls on the collimator and on the target



Emittance measurement 10/6/2020



Options at the irradiation point

- 600microsec at 1 Hz with intensity that can be chosen between 5 to 30mA that is 0.2 to 1.2 10^{19} protons/day
- Beam spot size : 2 mm to 20mm
- Energy 35 kV to 45 kV
- Protons anyone?

