
Study of the laser beam position and energy stability

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Outline

- Stability of the laser beam position
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Motivation of the TPC prototype

1. TPC chamber
2. Laser calibration

- Study and estimation of the distortion from the IBF and primary ions with the laser calibration system
- Main parameters
 - Drift length: $\sim 510\text{mm}$, Readout active area: $200\text{mm} \times 200\text{mm}$
 - Integrated the laser calibration with 266nm
 - GEMs/Micromegas as the readout
 - Matched to assembled in the 1.0T PCMAG

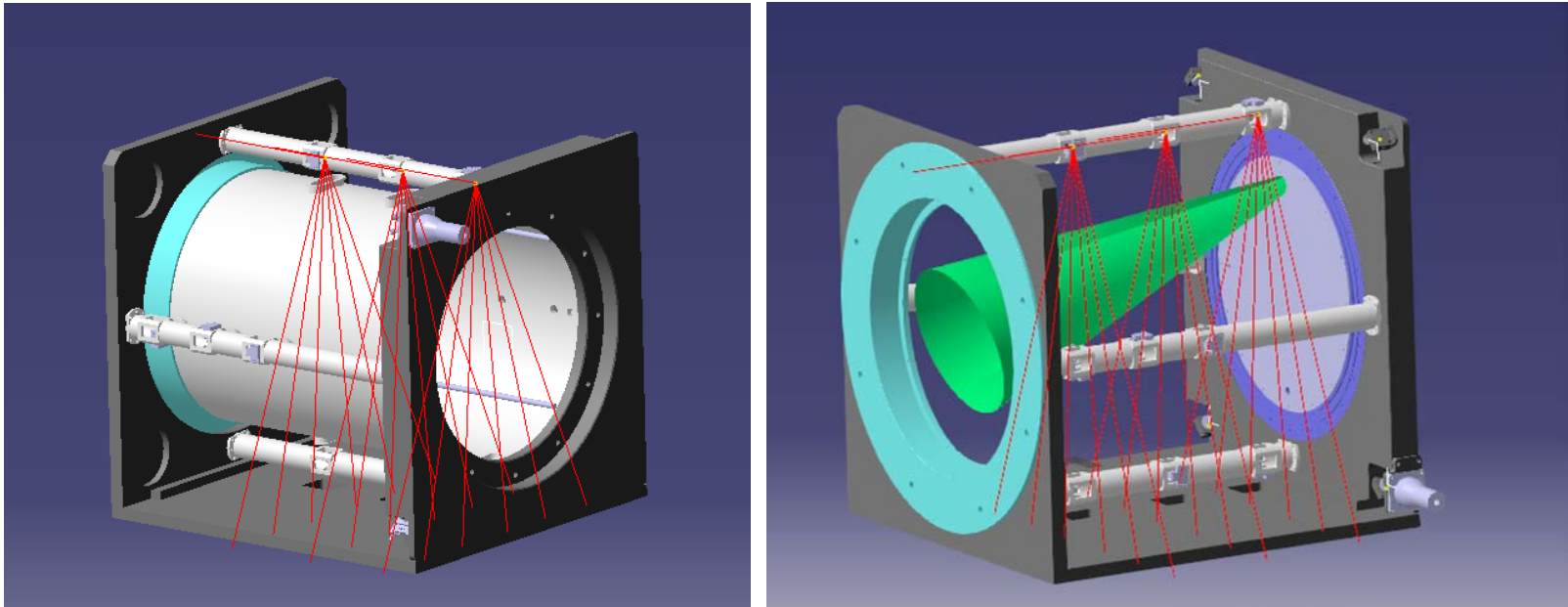
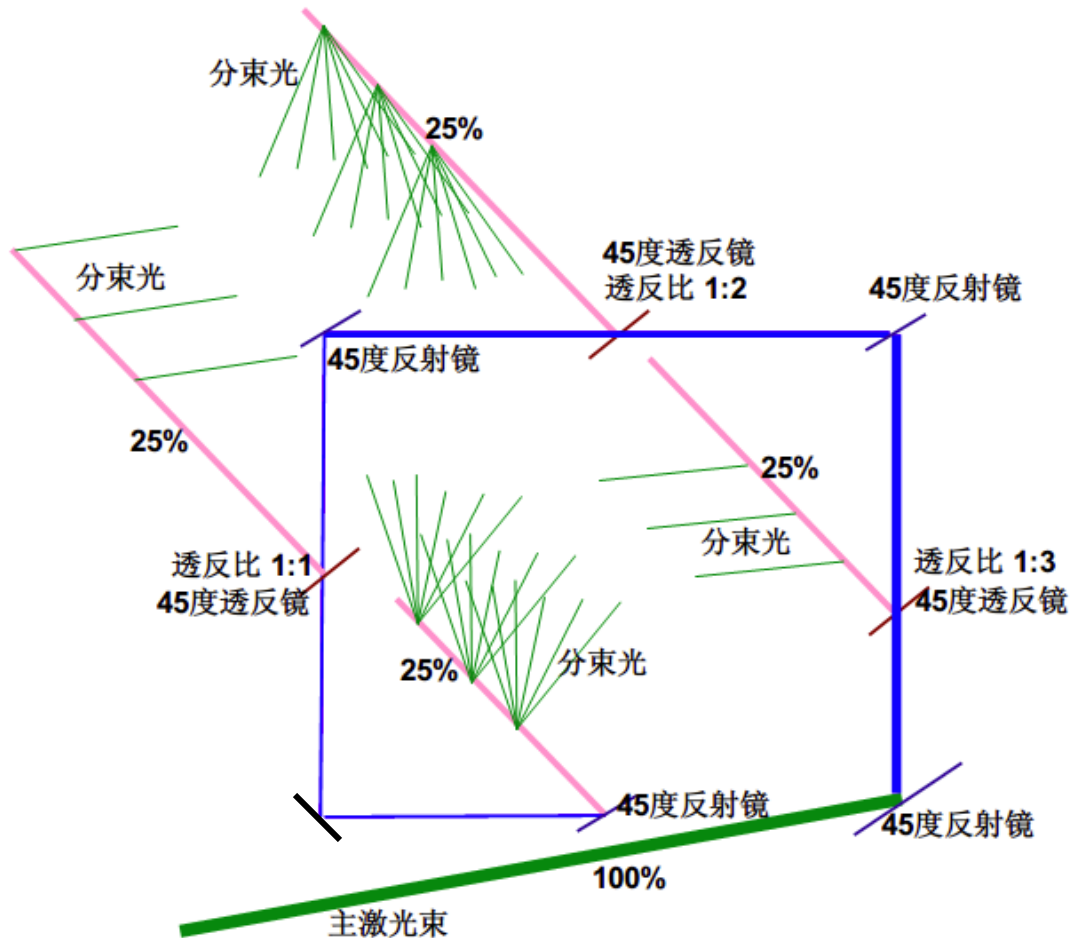


Diagram of the TPC prototype with the laser calibration system

Laser map design

- Number laser beam in chamber: 42
- Transmission and reflection mirrors

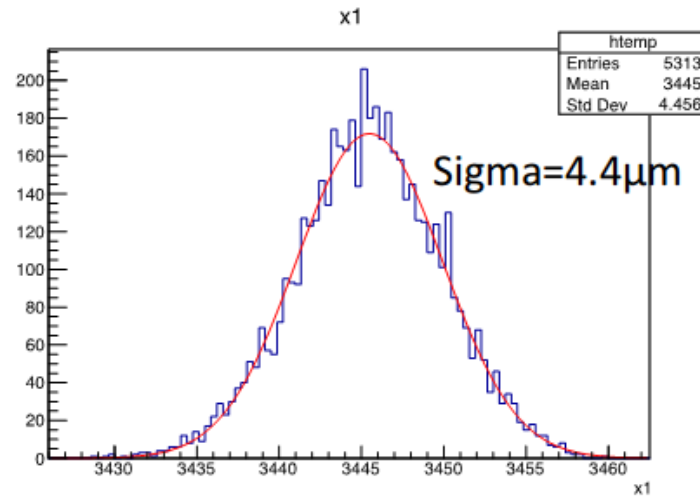
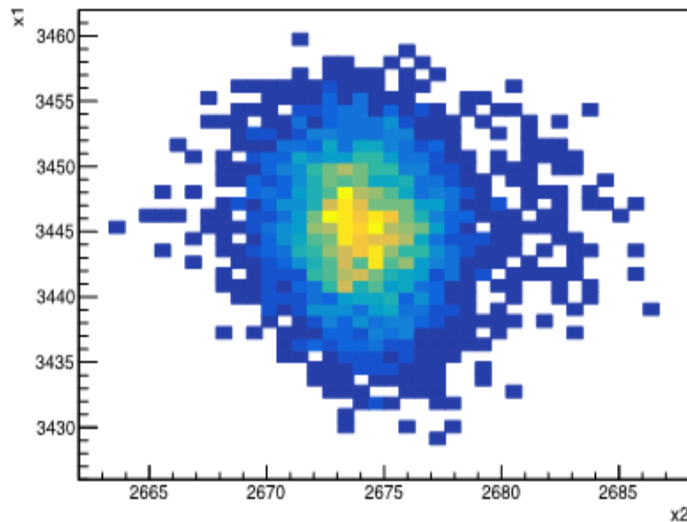
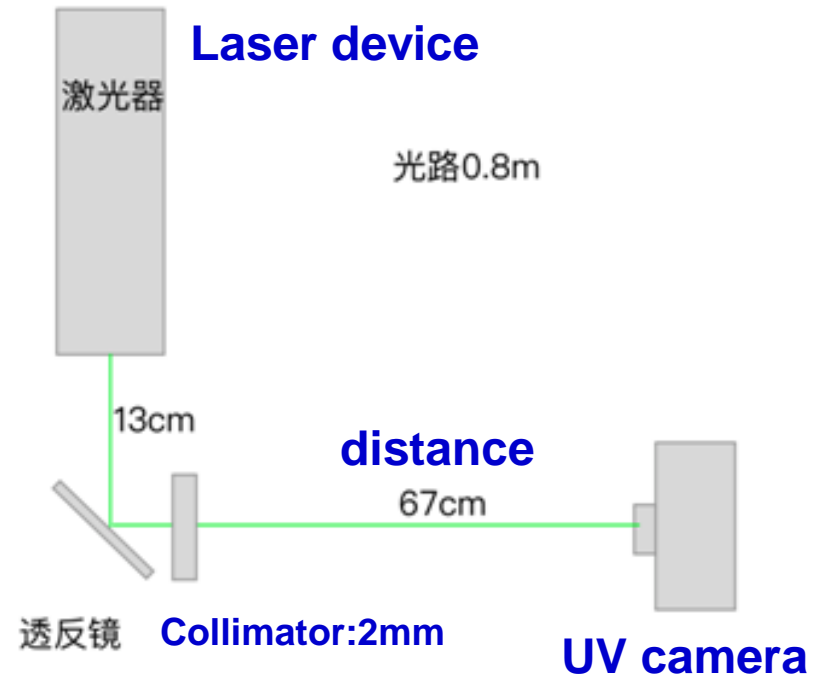
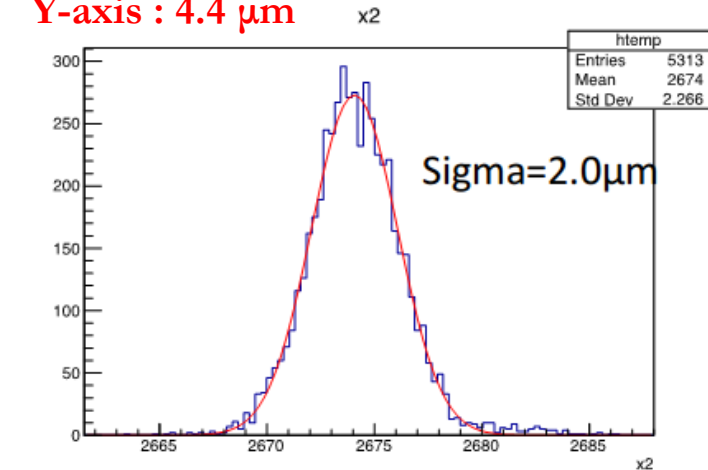
Laser beam's position and energy stability ?



Stability of the laser beam position

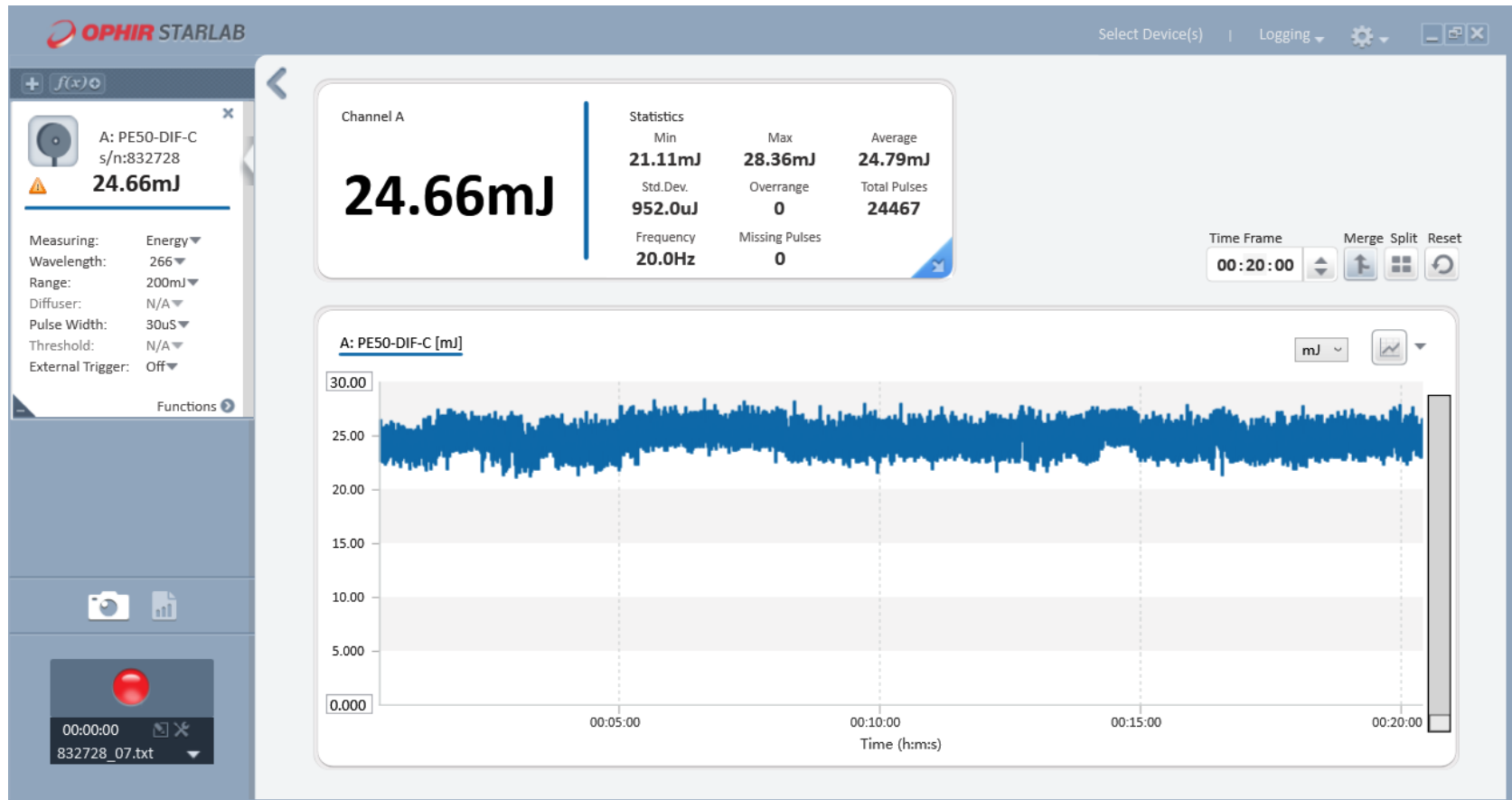
GOOD!

- Duration of measurement time: **10mins**
- Stability of the laser beam energy
 - **X-axis : 2.0 μm**
 - **Y-axis : 4.4 μm**



Stability of the laser beam energy @ mJ

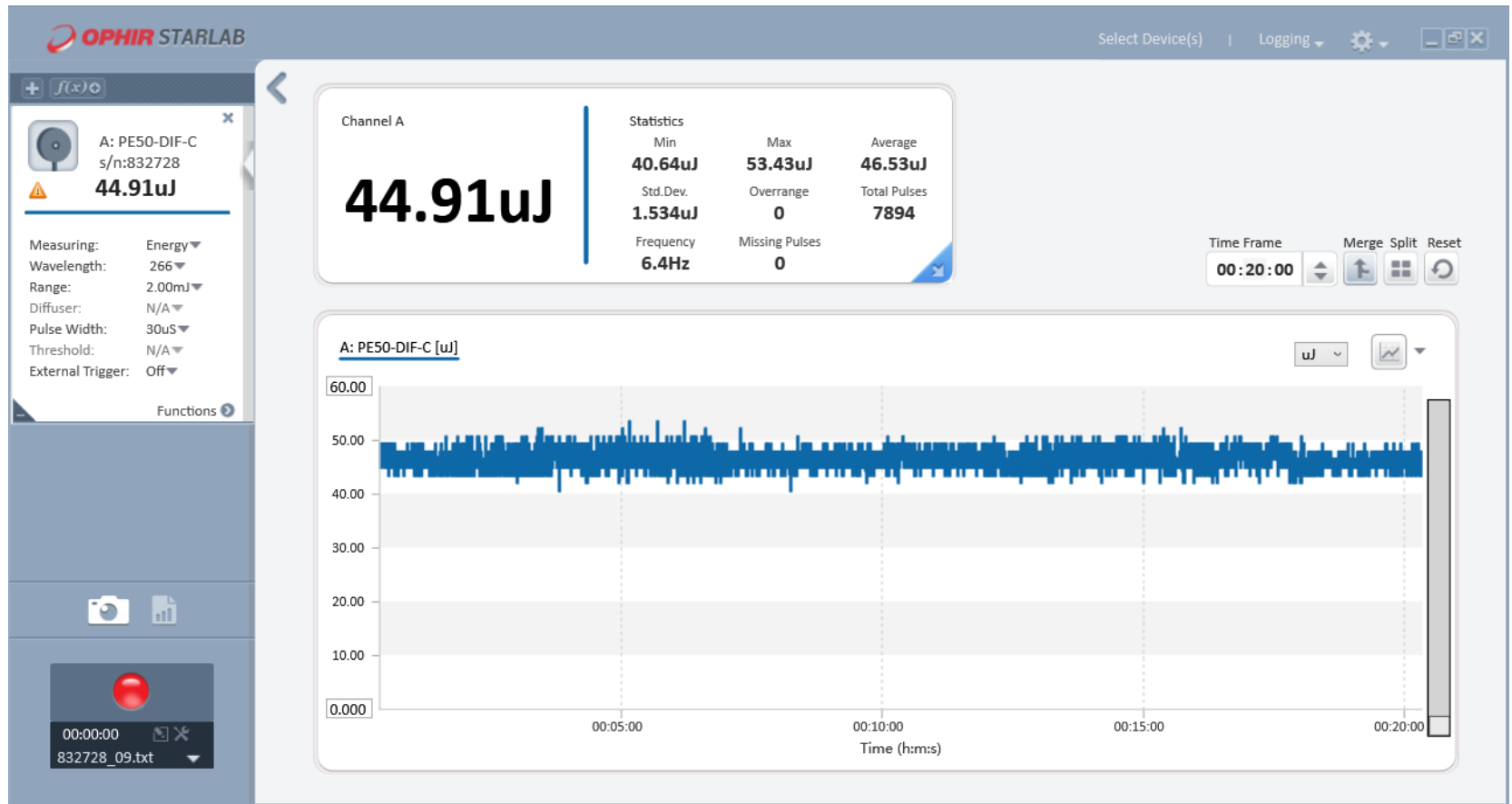
- ❑ Duration of measurement time: 20mins
- ❑ Average of the energy: 24.79mJ/ Φ 5mm
- ❑ Stability of the laser beam energy: 3.84%



Stability of the laser beam energy @ μJ

GOOD!

- ❑ Duration of measurement time: **20mins**
- ❑ Average of the energy: **46.53 μJ / $\Phi 5\text{mm}$**
- ❑ Stability of the laser beam energy: **3.3%**



Common discussion:

1. Schedule of the visiting IHEP in Oct?
2. New mesh material to Beijing arrived.
3. Plans (detector? Test of the different parameter of the mesh?)