

LPA2: Laser driven Proton Acceleration Applications

R Naz: D Giove (MI)
R Loc: GAP Cirrone

The ILIL PW laser facility in Pisa

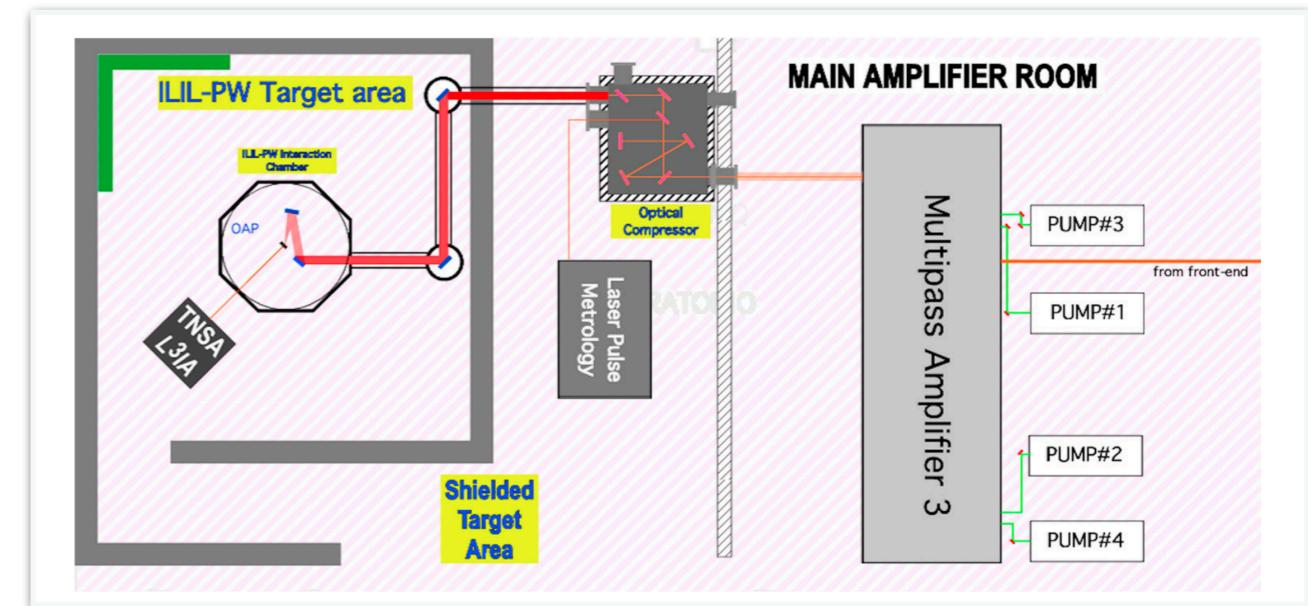
2

Amplitude 150 TW Ti:Sa laser system

Wavelength: 800 nm

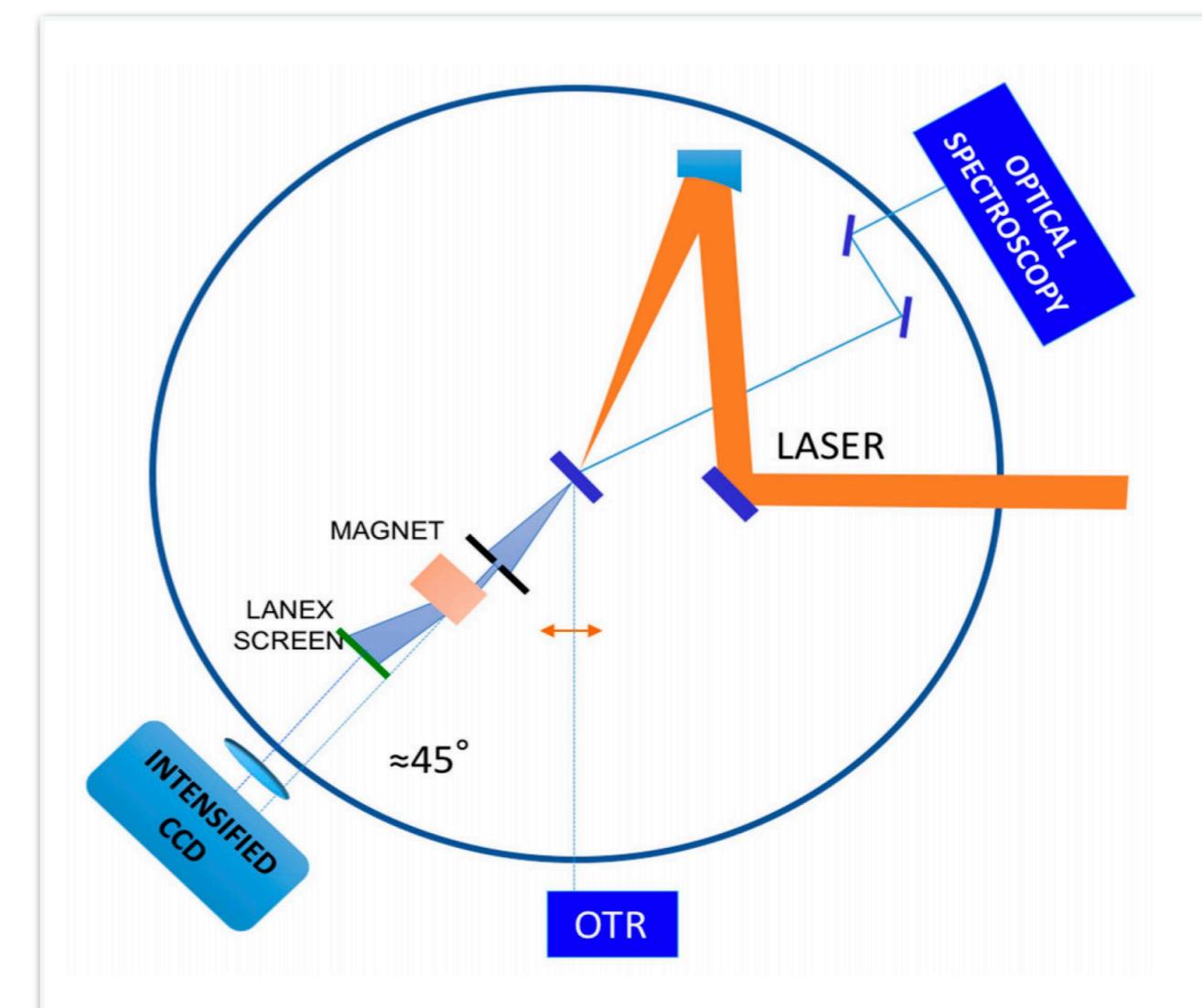
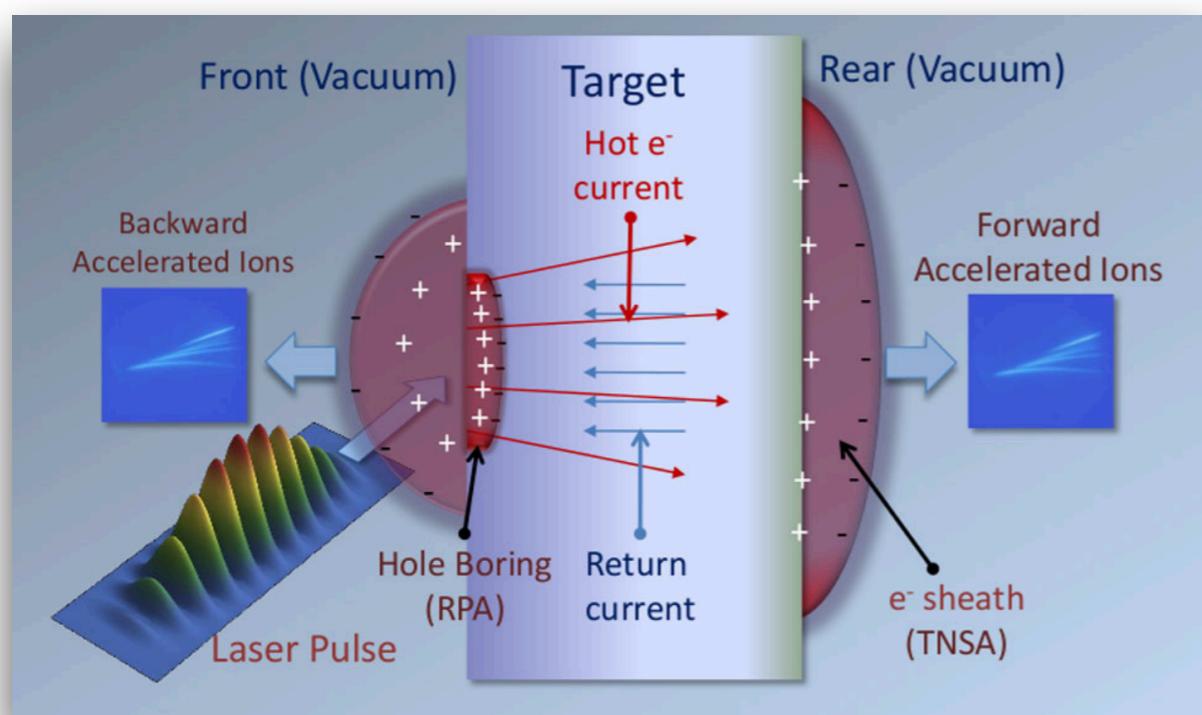
Pulse duration: compressed down to <25 fs

Intensity at the target: $> 10^{20} \text{ W/cm}^2$



Working energies: 6 - 8 MeV

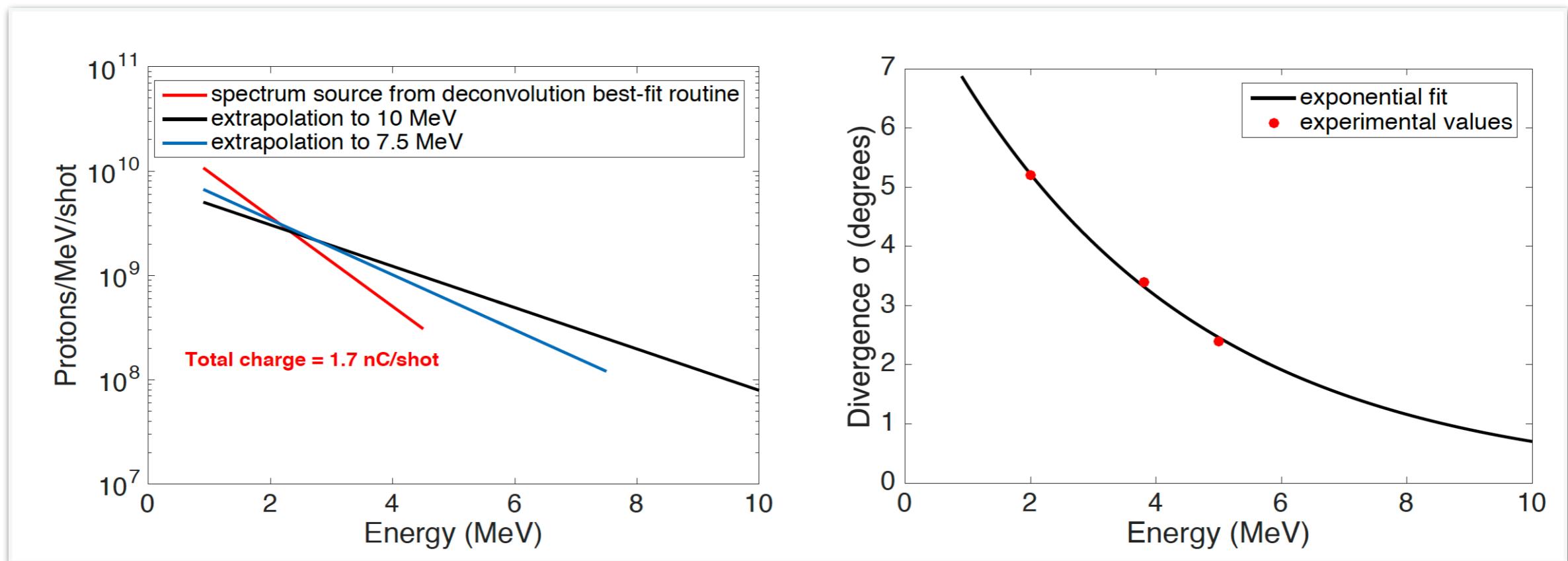
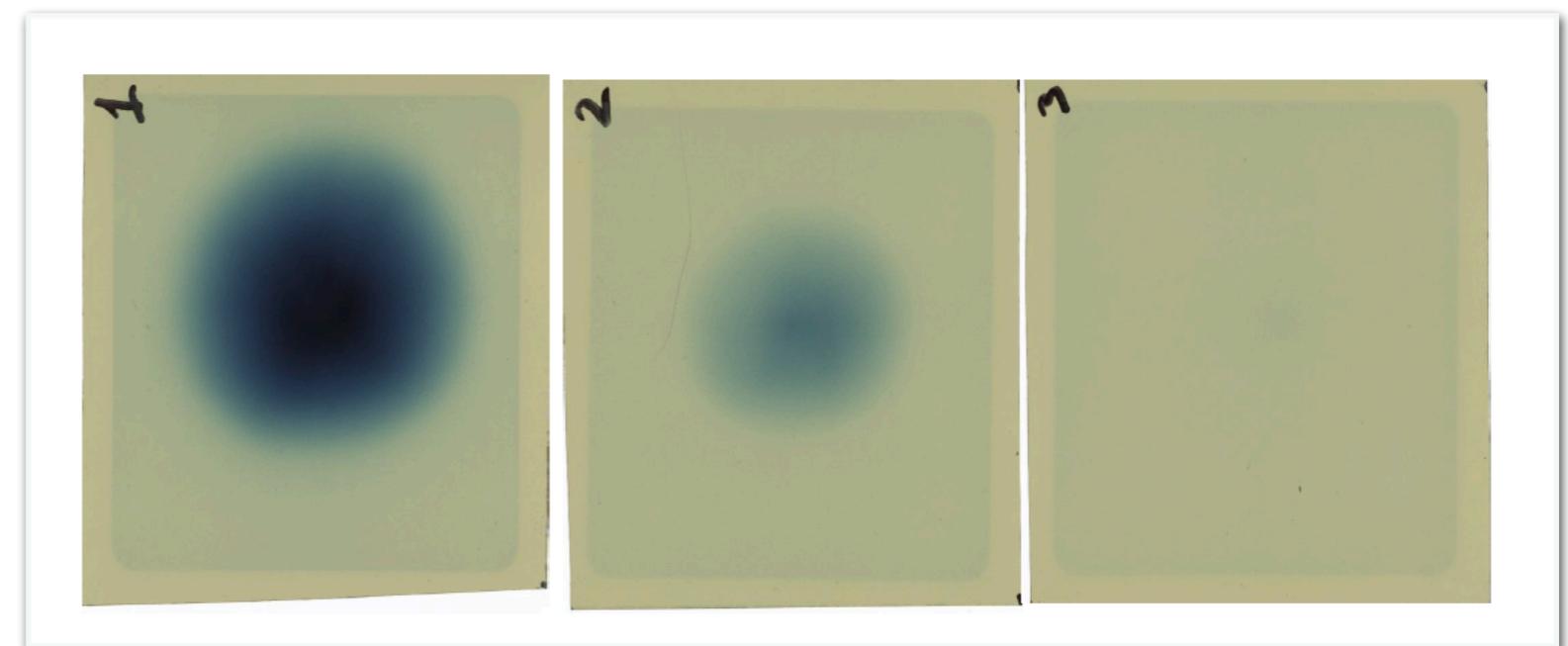
Dose per shot: 5 Gy



The ILIL PW laser facility in Pisa

3

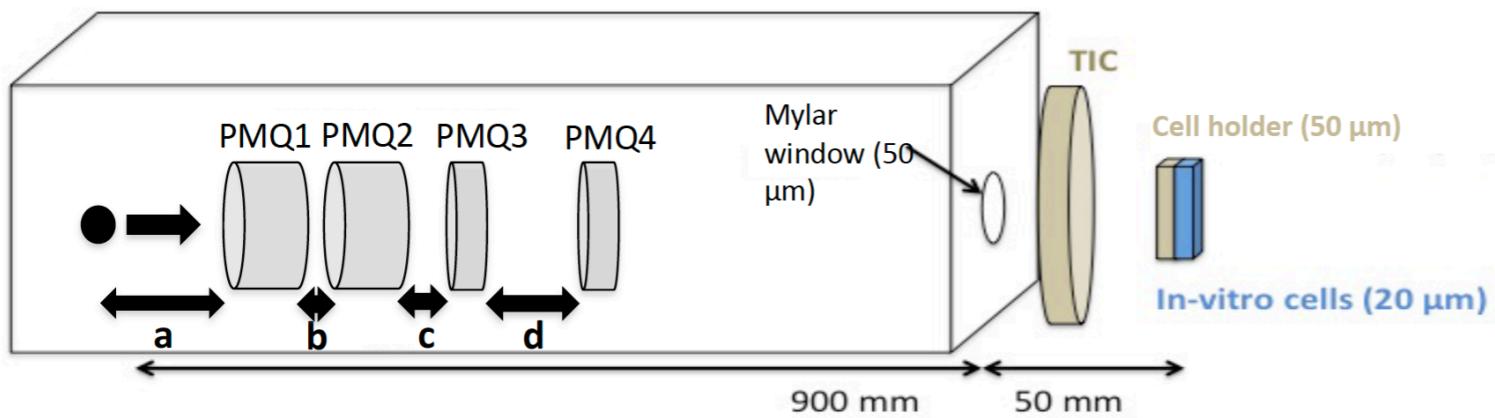
Use of radiochromic film
for proton spectroscopy



Use of the ELIMED quadrupoles

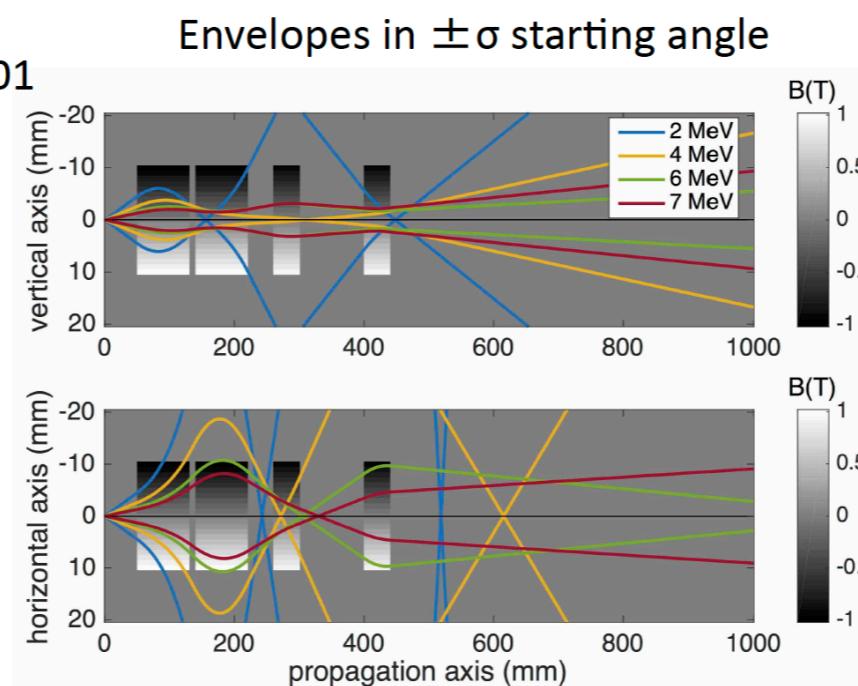
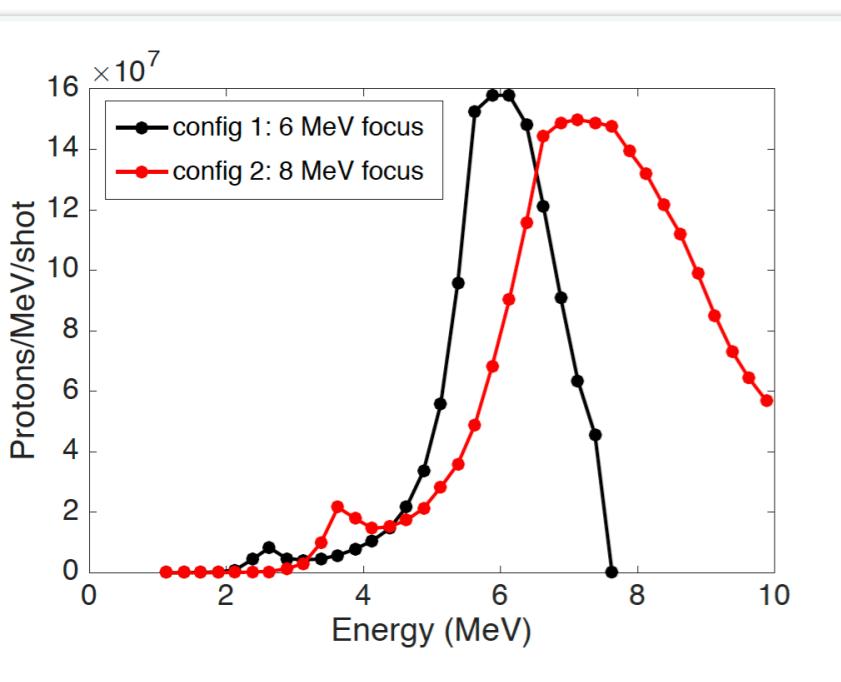
4

Selection of: 6 and 8 MeV



LOA configuration for 6 MeV focusing
DOI: [10.1103/PhysRevAccelBeams.20.032801](https://doi.org/10.1103/PhysRevAccelBeams.20.032801)

- A=50, b=10.3, c=40, d=100
- PMQ1,2: G \geq 100 T/m, length=80 mm, bore=20 mm
- PMQ3,4: G \geq 100 T/m, length=40 mm, bore=20 mm



LPA2 goals and participants

5

Finalise a first Italian radiobiology experiment with proton beams accelerated in a laser-matter interaction process

WP 1: laser and plasma source (L Labate, PI)

WP 2: beam line and experimental set-up (D Giove, MI)

WP 3: diagnostic and absolute dosimetry (GAP Cirrone, LNS)

WP 4: radiobiology (L Gizzi, PI)

Participants

BO, LNS, NA, MI, PI