

# Beam manipulation through plasma density modulation

Cornelia Gustafsson, Lund University



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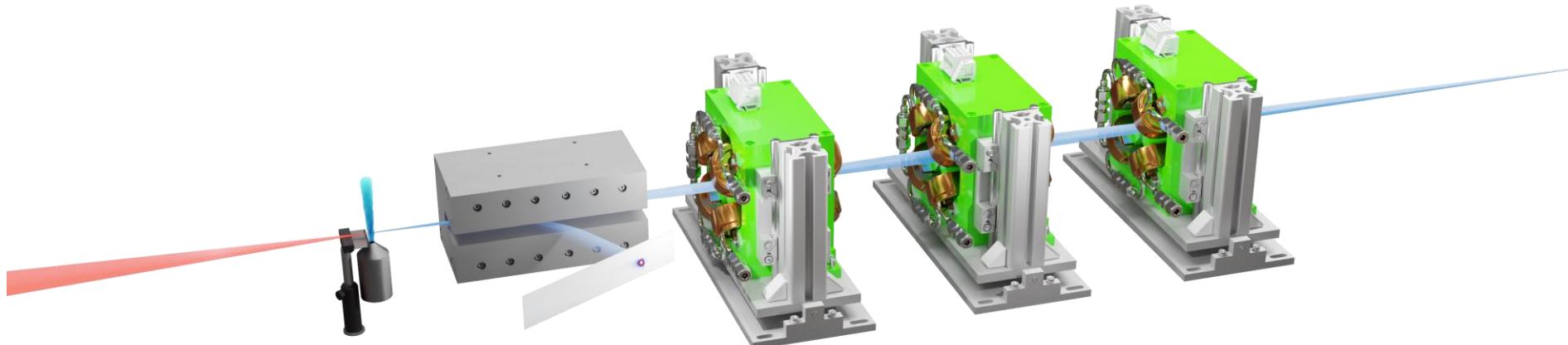
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EUROPEAN NETWORK FOR NOVEL ACCELERATORS  
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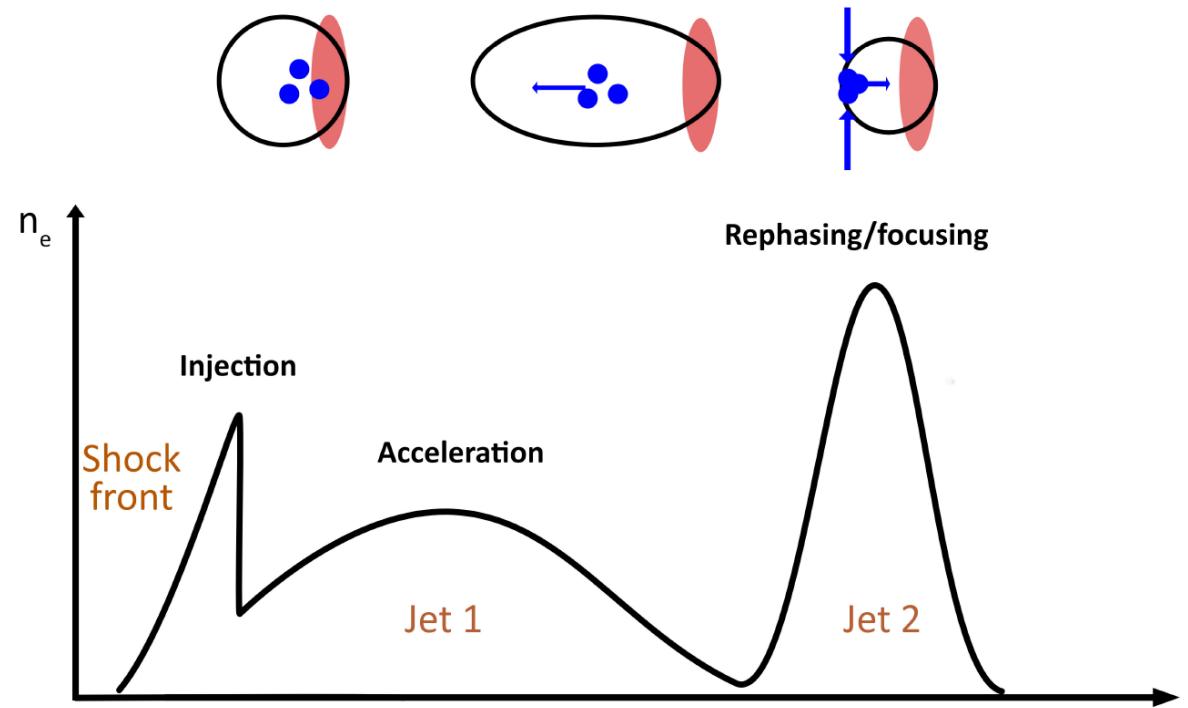
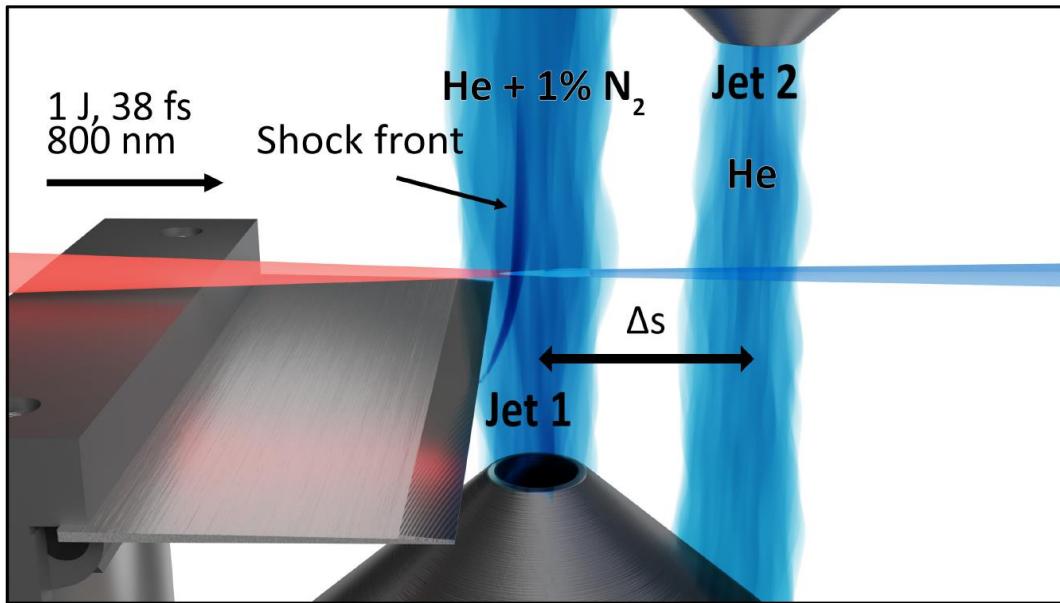


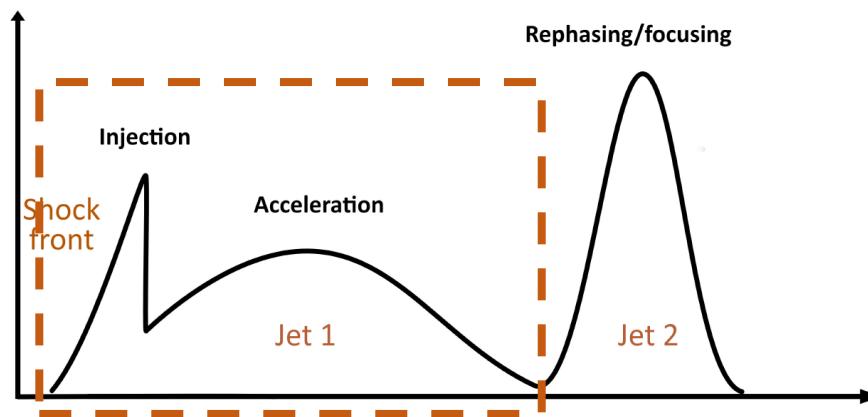
# Motivation

- VHEE- effective dose delivery at target (K. Svendsen et al. *Sci Rep* **11**, 5844 (2021)).

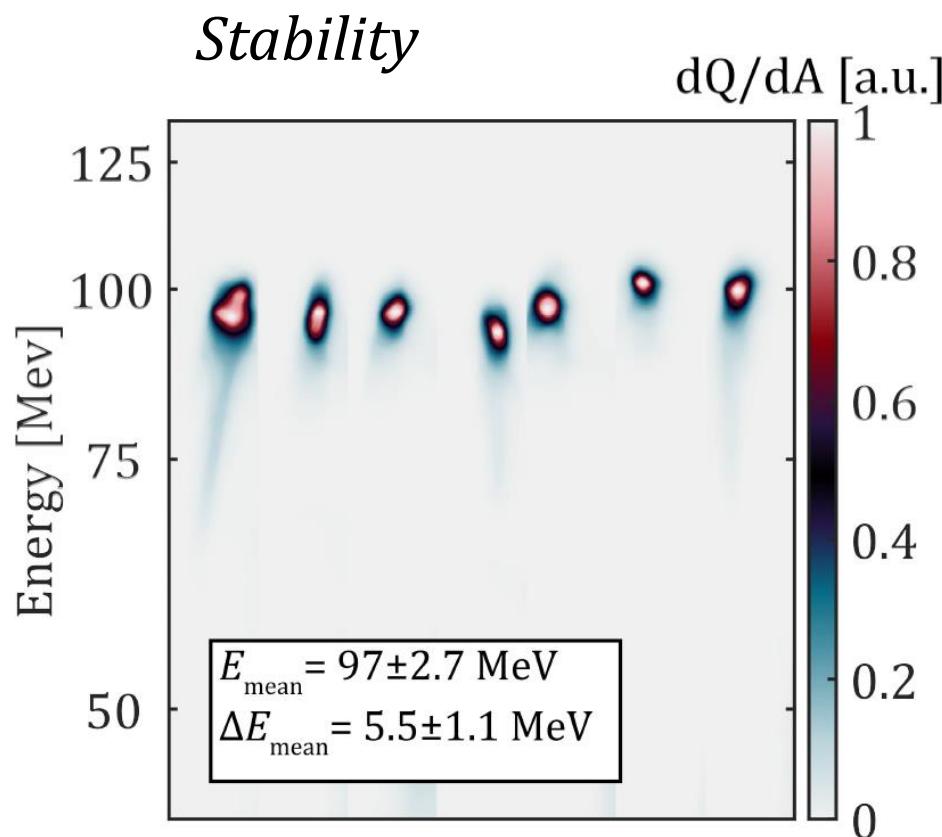


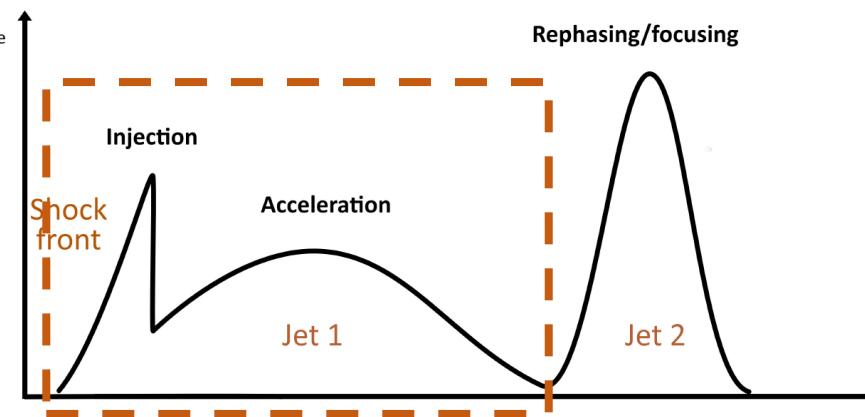
# Experimental setup and key-concept



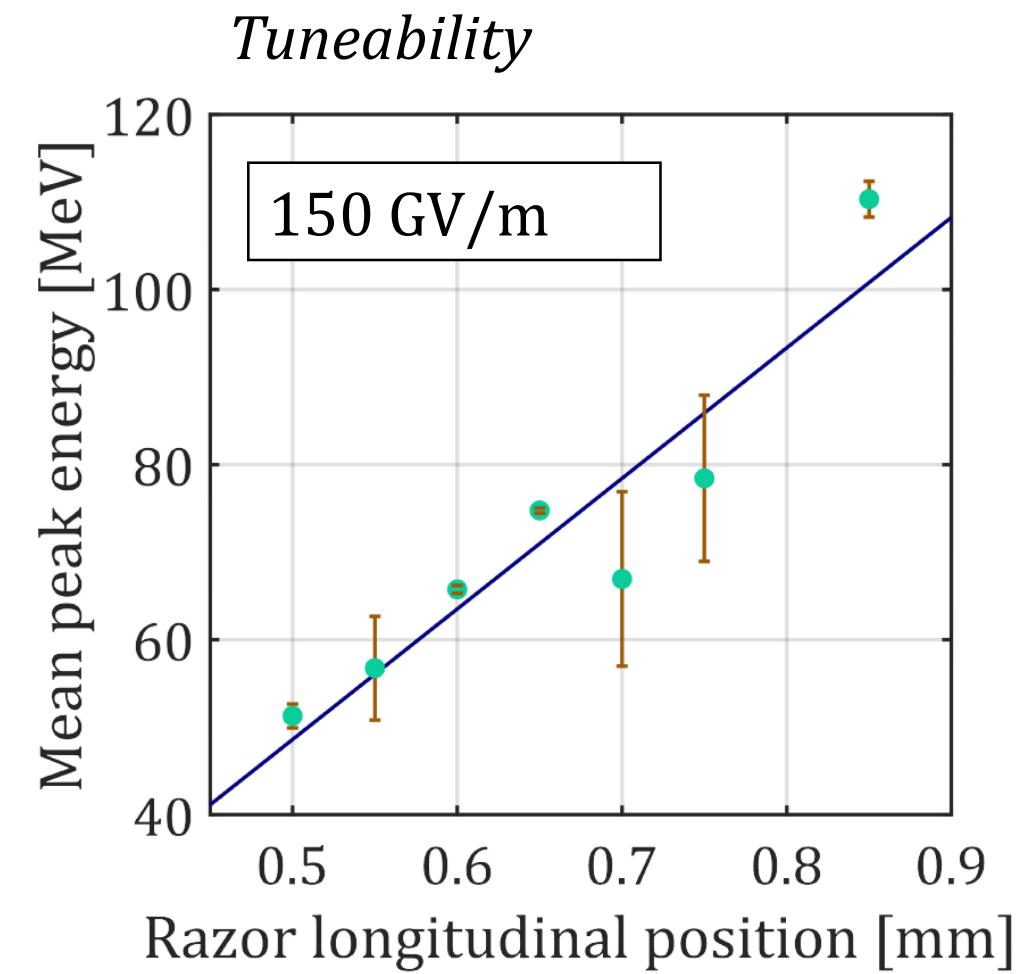
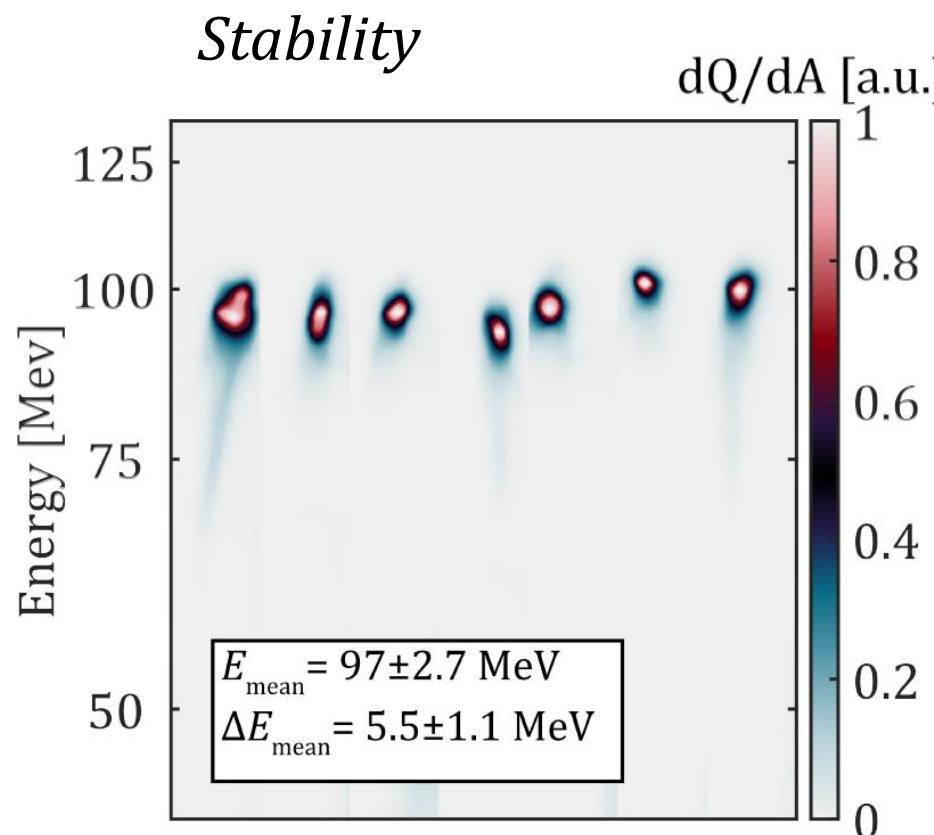


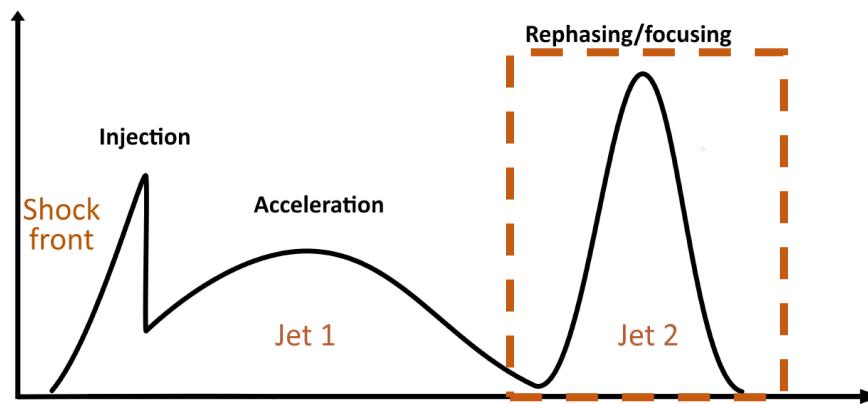
## Shock-assisted ionisation injection



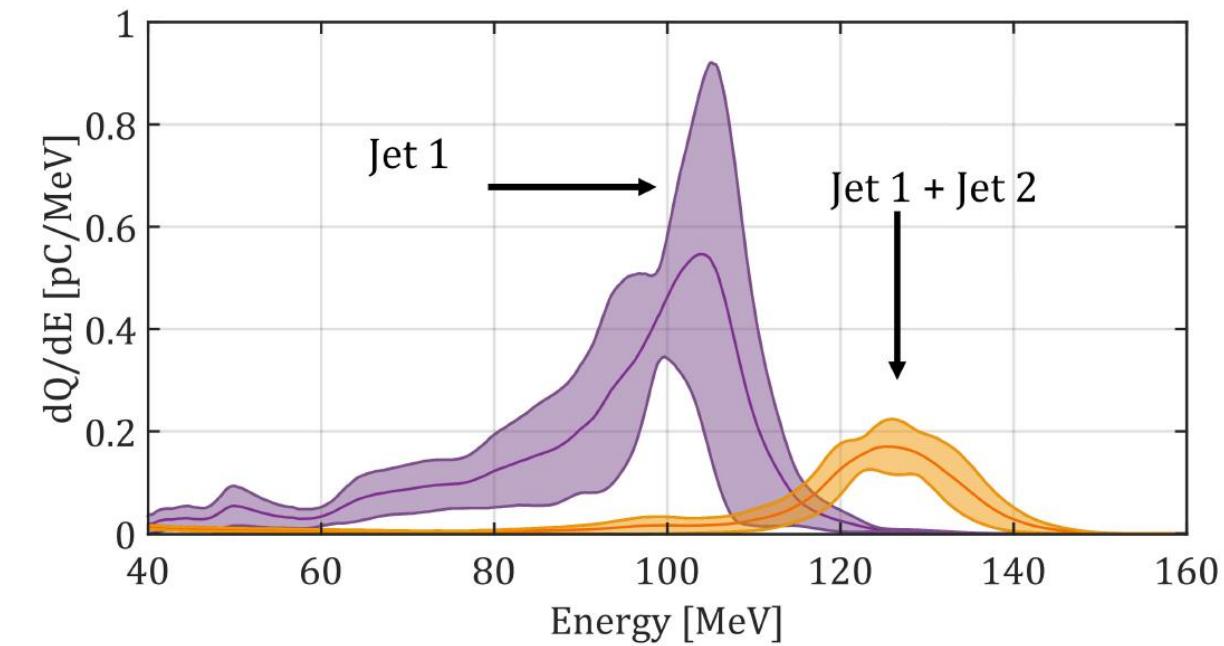
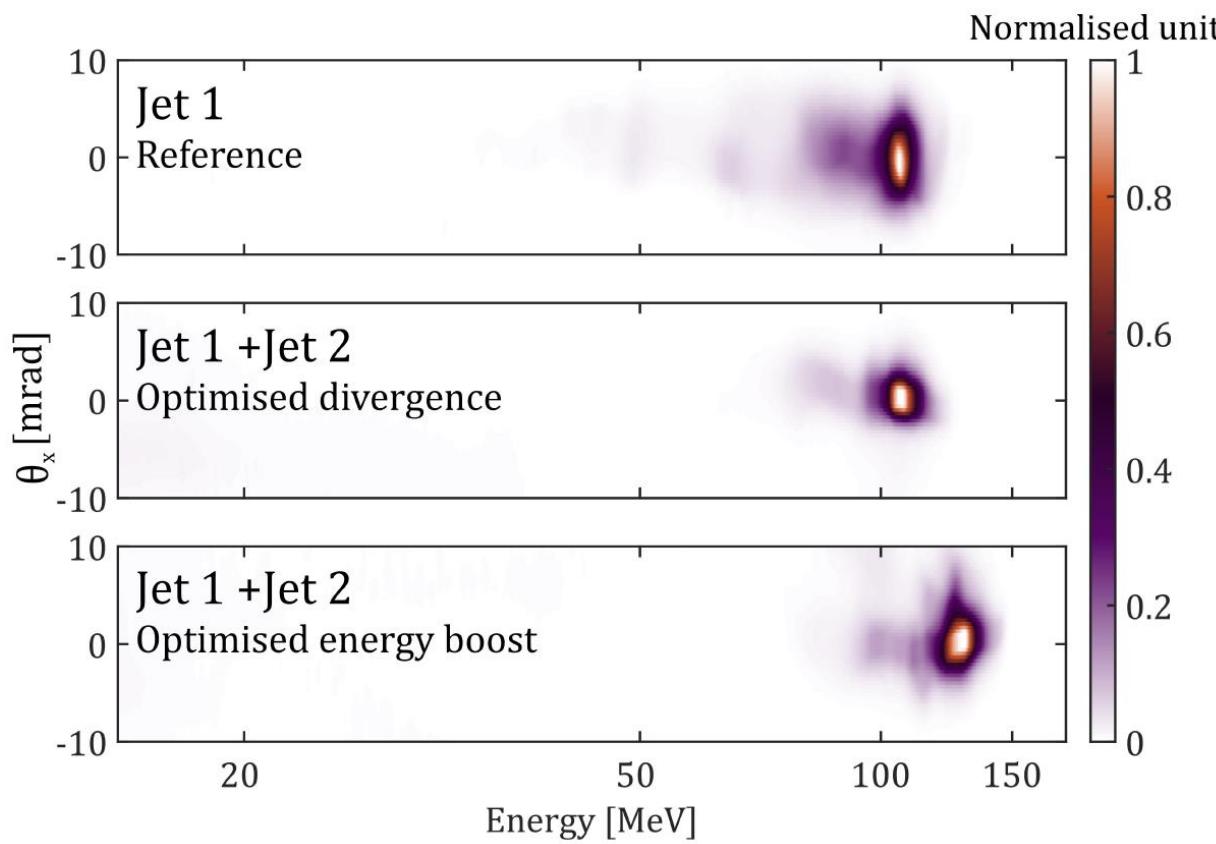


## Shock-assisted ionisation injection

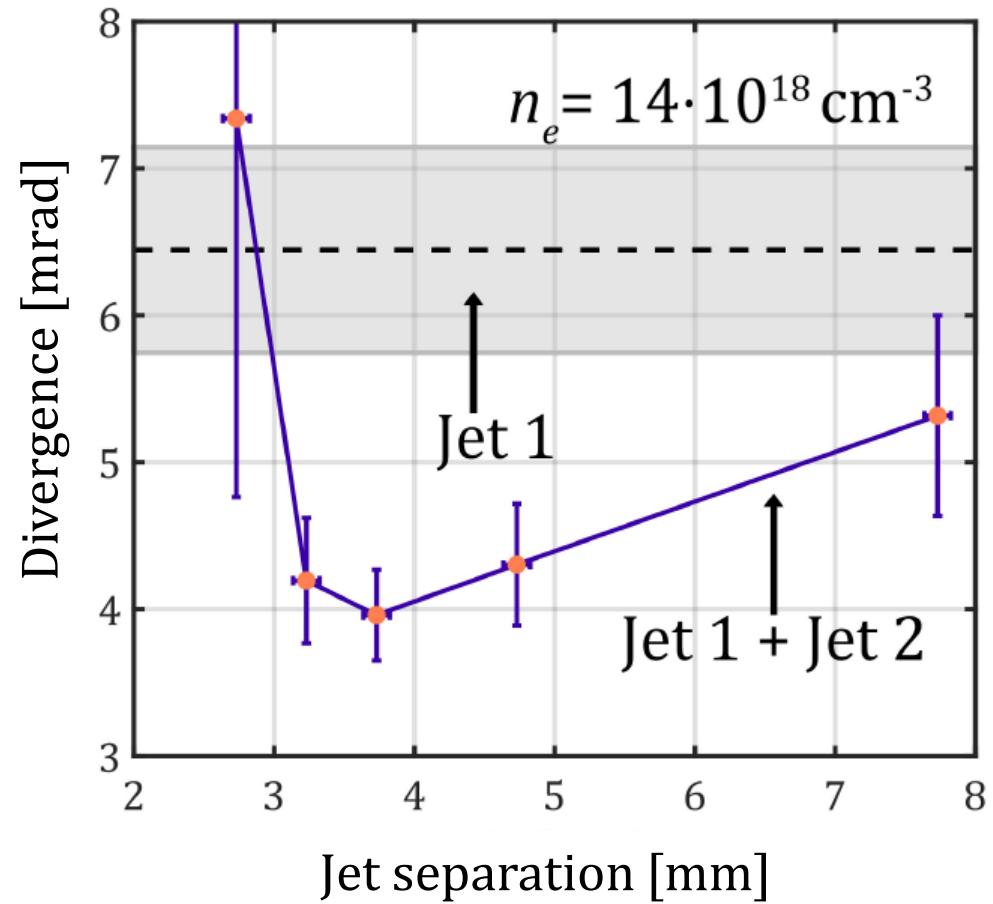




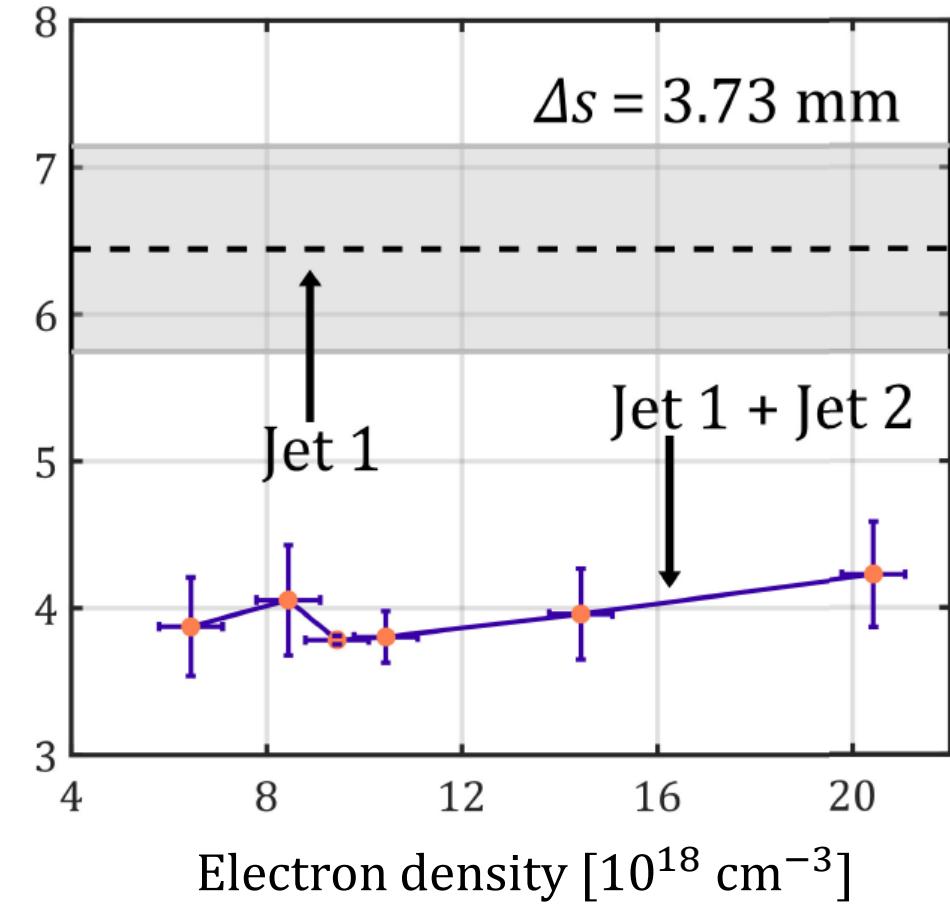
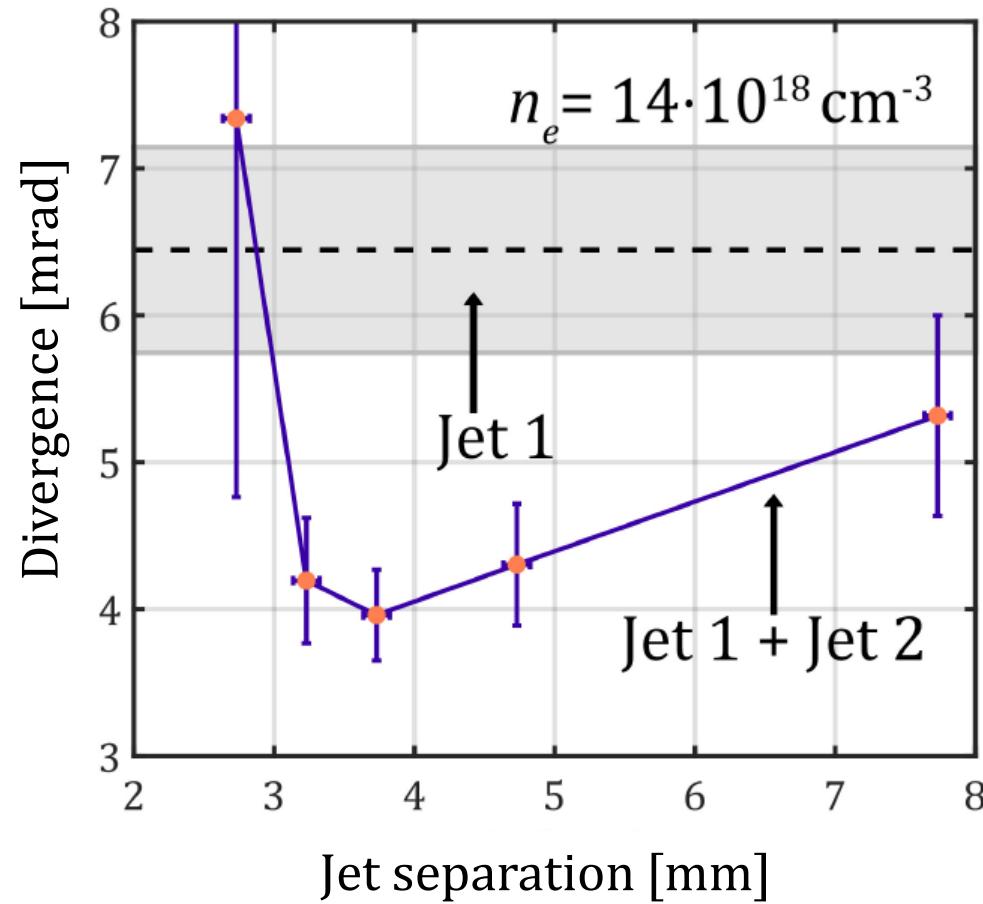
## Influence of a second jet



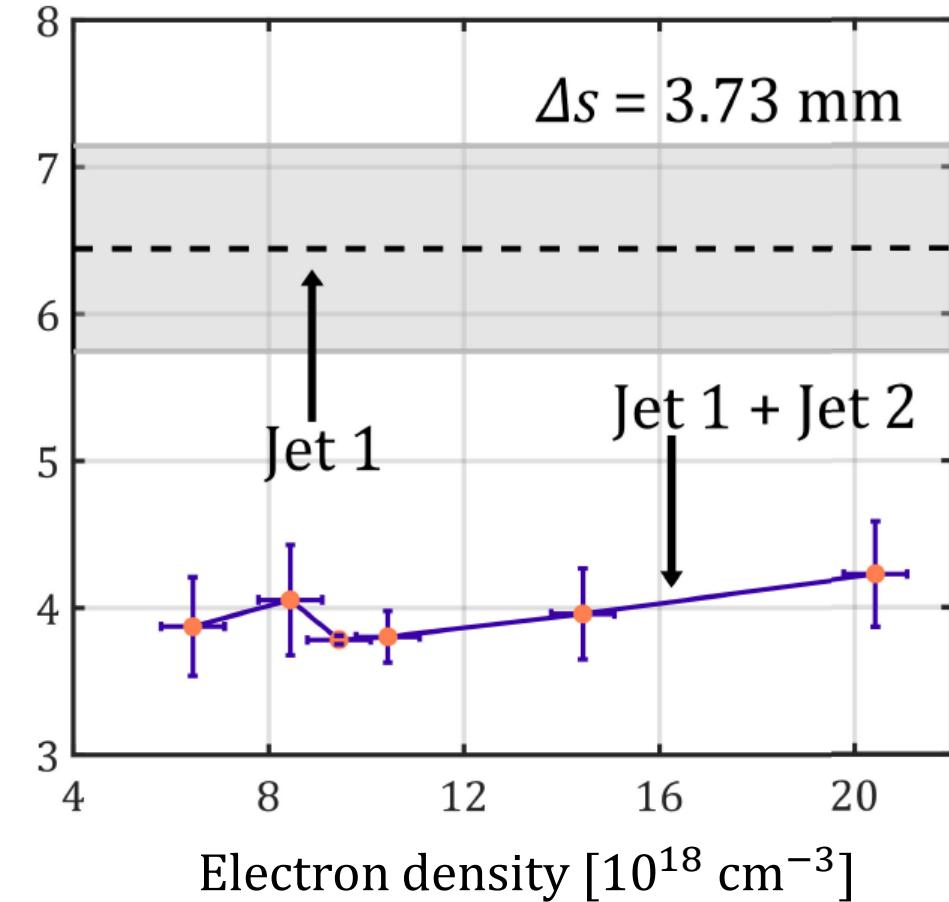
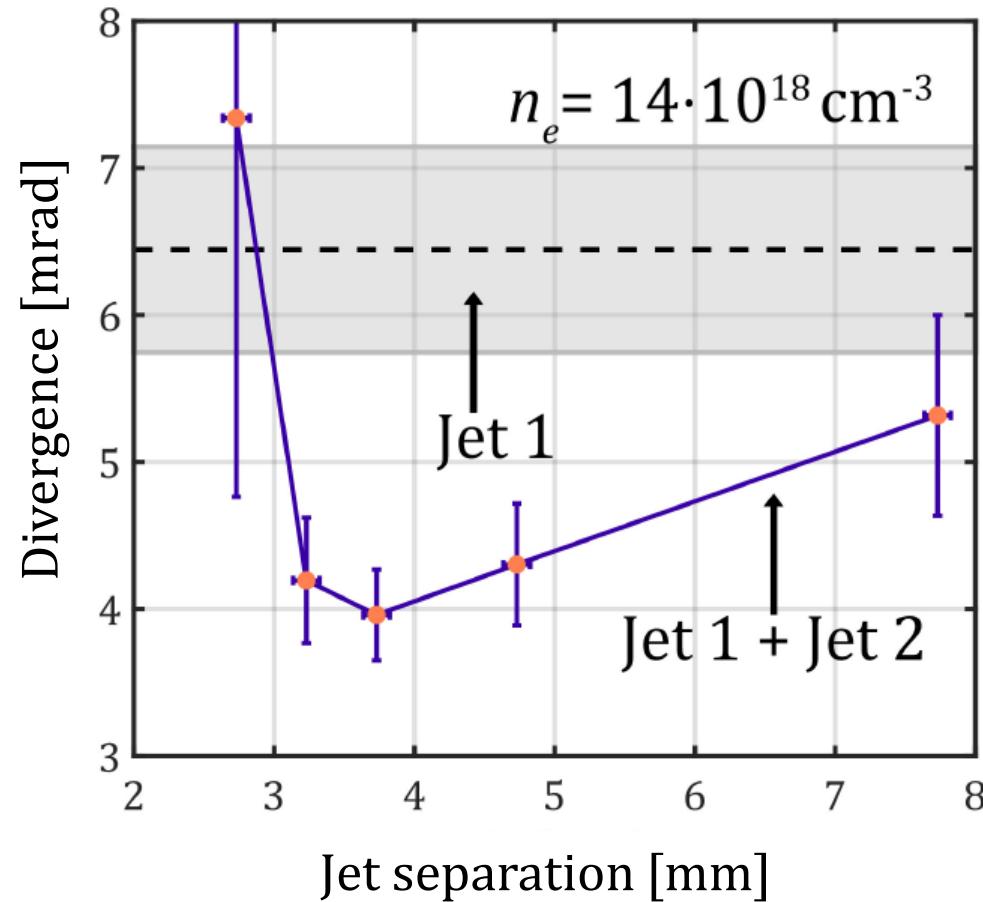
# Divergence reduction



# Divergence reduction

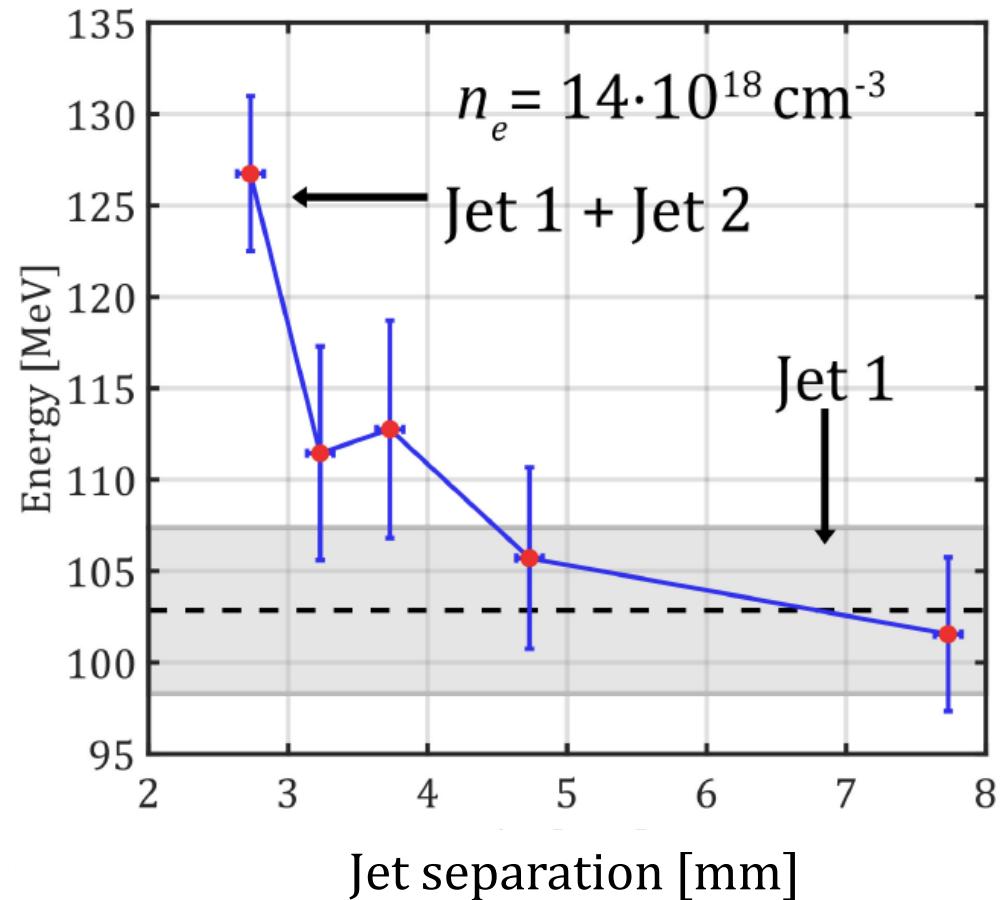


# Divergence reduction

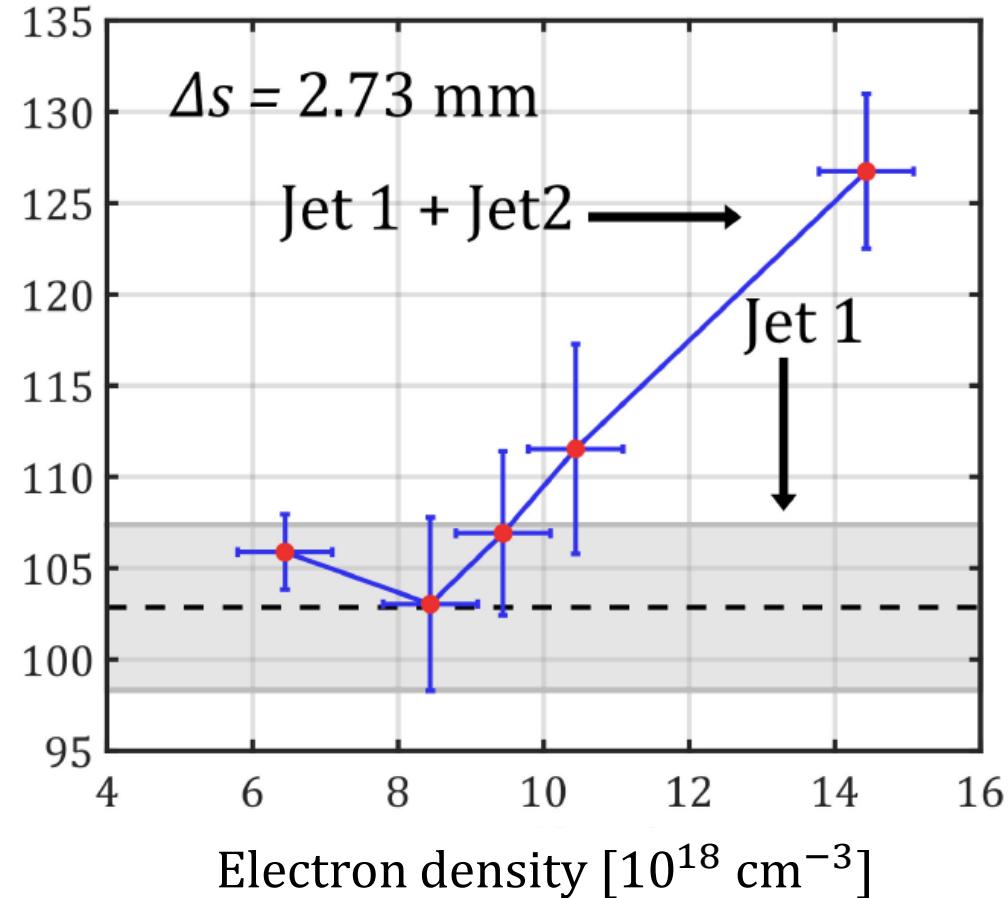
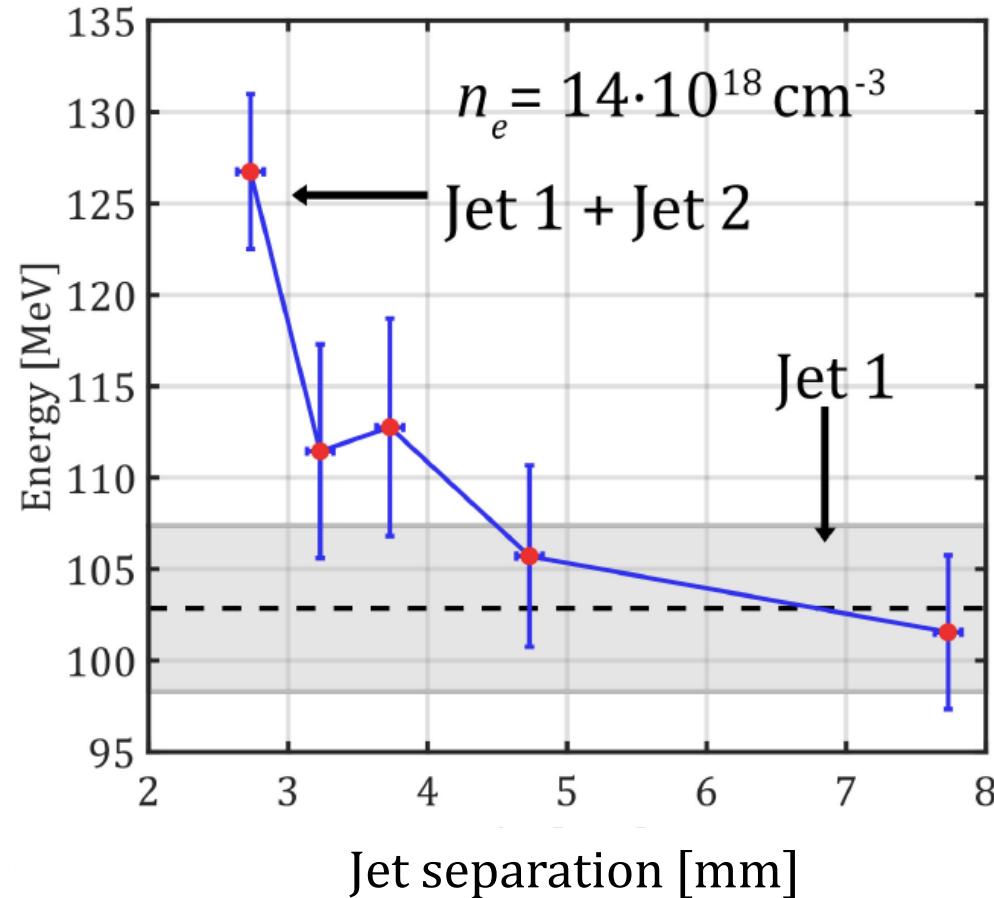


- An optimum position of Jet 2 relative to Jet 1
- Best focus at the detector is insensitive to density in Jet 2

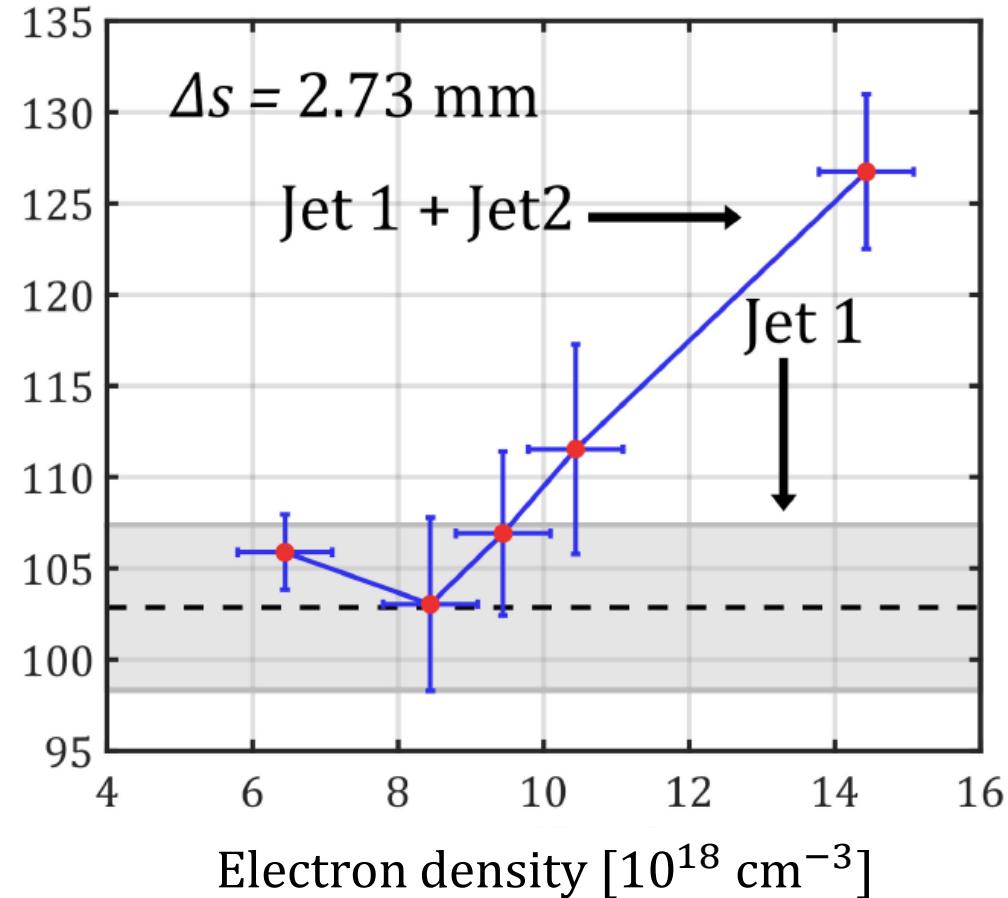
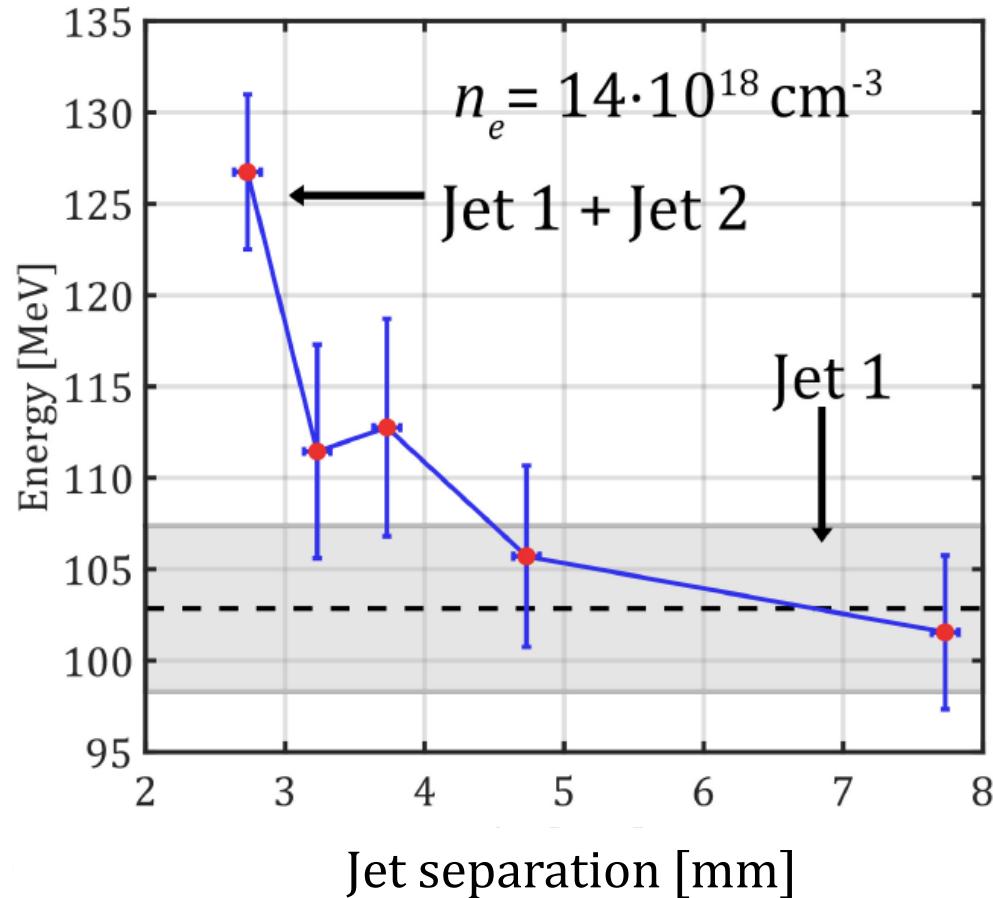
# Energy boost



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→ Energy boost depend on the jet separation and density

# Conclusion

Two regimes found with the second gas jet:

- Plasma lens
- Rephasing

## *Acknowledgements*

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