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Preliminary results from the CLEAR nonlinear plasma lens experiment

Monday 2 June 2025 16:00 (2 hours)

Plasma lenses are a compact way to transport an electron beam, since they offer strong focusing (kT/m) in both planes simultaneously. This becomes particularly important for highly diverging beams with a large energy spread such as those typically originating from plasma accelerators. The lens presented here is an active nonlinear plasma lens, with controlled nonlinearity purposely introduced in one transverse direction. It is a key element of a larger transport lattice, core of the ERC project SPARTA, *which aims to propose a solution for achromatic transport in plasma accelerator staging. We report on preliminary experimental results at CLEAR (CERN) which aimed to probe the lens magnetic field, in search of the desired nonlinearity, using the CLEAR electron beam as a probe*.*

Footnotes

- European Commission, Staging of plasma accelerators for realizing timely applications (2023). URL https://doi.org/10.3030/101116161

** Drobniak, P., Adli, E., Anderson, H. B., Dyson, A., Mewes, S. M., Sjobak, K. N., ... & Lindstrøm, C. A. (2024). Development of a nonlinear plasma lens for achromatic beam transport. arXiv preprint arXiv:2411.00925.

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