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## Study of the transfer and matching line for a PWFA-driven FEL

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The development of compact accelerator facilities providing high-brightness beams is one of the most challenging tasks in the field of next-generation compact and cost affordable particle accelerators. Recent results obtained at SPARC\_LAB show evidence of the FEL laser by a compact (3 cm) particle beam plasma accelerator. This work is carried out in the framework of the SPARC\_LAB activities concerning the R&D on particle-driven plasma wakefield accelerators for the realization of new compact plasma based facilities i.e. EuPRAXIA@SPARC\_LAB. The work here presented is a theoretical study demonstrating a possible scheme concerning the implementation of an innovative array of discharge capillaries, operating as active-plasma lenses, and one collimator to build an unconventional transport line for bunches outgoing from plasma accelerating module. Taking advantage of the symmetric and linear focusing provided by an active-plasma lens, the witness is captured and transported along the array without affecting its quality at the exit of the plasma module. At the same time the driver, being over-focused in the same array, can be removed by means of a collimator.

### Funding Agency

### Footnotes

### I have read and accept the Privacy Policy Statement

Yes

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