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First Laser Plasma Accelerator Based Seeded FEL

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We report the first lasing of a seeded FEL fully driven by a laser plasma accelerator. The experiment was performed at HZDR (Germany), coupling the high quality electron beams of the HZDR laser plasma accelerator with the versatile COXINEL beam manipulation line. Using an external seed at 270 nm, the FEL signal was observed at 275 nm. We explain how this slight red-shift confirms previous predictions [1], show the precise control over the FEL wavelength and give evidence of the longitudinal coherence of the emitted pulses. All experimental results are strongly supported by analytic modeling and Genesis numerical simulations. Our results substantiate the continuous progress of LPA technology to enable FEL operation and finally bring temporal coherence to those compact promising sources.

[1] M Labat et al 2020 New J. Phys. 22 013051.

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Yes

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