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## Laser Plasma Accelerator Based Seeded FEL Commissioning on COXINEL at HZDR

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The tremendous developments on Laser Plasma Accelerators (LPAs) have significantly improved the electron beam properties and stability making it possible to drive a Free Electron Laser (FEL). We report on the electron beam transport and manipulation using the COXINEL beamline implemented at HZDR that has recently led to the first measurements of an LPA-based seeded FEL in the UV region. Our experiment, cross-checked with ELEGANT simulations, shows that the beamline enables the handling of the large divergence via high gradient quadrupoles, reducing the slice energy spread with the help of a chicane, controlling the position and dispersion in both transverse planes using beam pointing alignment compensation and implementing the super matching optics. We also show that the beamline properly allows for the spectral tuning and spatial overlapping between the electron beam and the seed, using electron and photon beam diagnostics, and thus making LPA based FEL amplification within reach.

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