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Sensitivity of the optical-klystron-based high-gain harmonic generation on the electron beam energy profile

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Externally seeded free electron lasers (FELs) offer fully coherent and stable FEL radiation in the soft x-ray regime. While electron bunches of superconducting-based FELs are available at MHz repetition rates, seeded radiation is limited by the repetition rate of the seed laser used in the process. Combining standard seeding schemes with an optical klystron is a simple and promising trick to reduce the seed laser power requirements and allow externally seeded radiation at higher repetition rates. To ensure optimum operation, we study the combined effect of a linear and a quadratic electron beam energy chirp on the properties of the output FEL radiation.

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Footnotes

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Yes

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