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Fully Coherent Soft X-ray Pulse Generation Based on ERL

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Energy recovery linacs (ERLs) possess bright prospect of the fully coherent x-ray generation. Recently, we designed a 600 MeV energy recovery linac capable of producing high power fully coherent radiation pulses at 13.5 nm with a relatively low-intensity 256.5 nm seed laser profited from the employment of angular-dispersion-induced microbunching (ADM) technology. We also designed a matched multiplexed system that can deflect each radiator by 8 mrad with a carefully choreographed multi-bend achromat (MBA) scheme. As a result of downstream MBA's dispersion compensation, bunching factors will be enhanced both at fundamental wavelength and high harmonics. The bunching factor of the 19th harmonic increased from 10% to 26%, and that of the 57th harmonic became 7.8%, which is sufficient to generate fully coherent radiation in the soft X-ray range.

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Footnotes

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Yes

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