G. Wang: Generation and application of the fresh-slice multistage amplification mode in Athos

Report of Contributions

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We present the progress of generating high-power and short FEL pulses using the fresh-slice multistage amplification scheme at Athos, the soft X-ray beamline of SwissFEL. We use a transversely tilted electron beam traveling through the unique Athos layout with magnetic chicanes between every two undulator modules. The tail of the bunch produces a short pulse in the first amplification stage. The rest of the electron beam further amplifies the short FEL pulse in up to three additional stages. Our results show the production of FEL radiation with pulse energies of several hundreds of microjoules and pulse durations of about one femtosecond. This operation mode will allow us to advance the scientific opportunities of nonlinear optics and imaging experiments.

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