

# Physics and Applications of High Brightness Beams



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## High Efficiency FEL

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Strongly tapered free-electron lasers (FELs) offer a promising avenue towards achieving higher peak and average power radiation sources. Through the strong seeding of an input laser or microbunched electron beam, larger efficiencies can be achieved by adapting the undulator parameters to maintain resonance with the decelerated electrons. Additionally, the use of an oscillator cavity driven by a high repetition rate electron beam could enable power amplification from a weaker seed. In this context, we discuss ongoing research efforts and recent progress in developing high efficiency FELs, as well as the tools used to study these systems.

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