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Coherence Enhanced Transient Lasing PANKAJ JHA, ANATOLY SVIDZINSKY, Texas A&M University, MARLAN SCULLY, Texas A&M University and Princeton University — We study the effect of a coherent drive on transient lasing with inversion in three-level Λ and Ξ configurations ($c \leftrightarrow a \leftrightarrow b$). We show that the presence of a resonant coherent drive on the $a \leftrightarrow c$ optical transition can yield substantial enhancement of the output laser energy on a $a \rightarrow b$ XUV or X-ray transition. We demonstrate the crucial role of coherence ϱ_{ac} for this laser power enhancement. Contrary to the forward direction, where forward gain can be enhanced for some choice of Ω_c, coherent drive on the ac transition always suppresses the backward gain. Thus, the use of a coherent drive at optical frequency could be a useful tool for increasing power of lasers in XUV and X-ray regions.

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