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Novel high power femtosecond laser system and progress towards improved EUV fs frequency combs JASON JONES, JANE LEE, JUSTIN PAUL, University of Arizona — The development of femtosecond frequency combs has had a dramatic impact in ultrafast science and optical frequency metrology. Recent work has demonstrated that the coherent comb-like structure can be extended into the vacuum and extreme ultraviolet regimes utilizing fs enhancement cavities and intracavity high harmonic generation. This offers the potential to open the field of precision frequency metrology to previously unexplored regimes. The development of higher power fs comb sources can greatly alleviate the design constraints on the fs enhancement cavities and aid in greatly improving the efficiency of this approach. We generate a record 7 Watts average power from a Ti:s fs frequency comb by optical injection-locking an amplification cavity, enabling efficient power scaling of fs frequency combs in bulk solid-state systems. We will present our current progress in utilizing this source with modified designs for a fs enhancement cavity to generate fs frequency in the EUV utilizing intracavity high harmonic generation.

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