

Abstract Submitted
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Prism-based Cr:forsterite laser frequency comb stabilization and carrier-envelope offset frequency linewidth narrowing.¹ RAJESH THAPA, KARL TILLMAN, KEVIN KNABE, ANDREW JONES, BRIAN WASHBURN, KRISTAN CORWIN, Kansas State University — Infrared frequency combs in the near IR, based on lasers such as Cr:forsterite, are important for frequency measurements in the telecommunications band. We have actively stabilized a self-referenced prism-based Cr:forsterite frequency comb using both prism and power control inside the cavity. We also report dramatic reduction in the linewidth of the carrier envelope offset frequency (f_0) by at least two orders of magnitude simply by inserting a knife edge into the laser cavity after the prisms. We have stabilized the laser when the f_0 beat width was both wide (~ 1.5 MHz) and narrow (~ 10 kHz) although the locking was less robust with the narrower beat note. We measured the fractional stability of the comb by counting the repetition frequency (f_r) and f_0 . The fractional stability of the comb at 10 s was limited by the frequency counter resolution to $< 10^{-12}$. An optical characterization of the stability is in progress. Furthermore, we will use this comb to characterize optical frequency references based on acetylene-filled hollow photonic band gap optical fibers.

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