a 115-nm (14.5 THz) span to better than 3×10^{-15} relative to the optical frequency. Based on these results and the compatibility with CMOS electronics, this extremely compact source can serve as a fully chip-scale replacement for relatively bulky mode-locked lasers in many precision frequency metrology and ultrafast photonic applications. In particular, this robust source is ideal for applications where large comb tooth separation are desired such as the calibration of astronomical spectrographs [24–26], line-by-line pulse shaping [20,27], and ultra-high-speed communications systems.

Acknowledgments

This work was supported by DARPA under the POPS and OAWG programs and by the Center for Nanoscale Systems, supported by the NSF and the New York State Office of Science, Technology and Academic Research. This work was performed in part at the Cornell NanoScale Facility, a member of the National Nanotechnology Infrastructure Network, which is supported by the National Science Foundation (Grant ECS-0335765).

#147573 - $15.00USD Received 13 May 2011; revised 24 Jun 2011; accepted 30 Jun 2011; published 11 Jul 2011