

Abstract Submitted  
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**Tunable Mid-Infrared Source based on Difference-Frequency Mixing of Soliton-Shifted Pulses** DAVID WINTERS, PHILIP SCHLUP, RANDY BARTELS, Colorado State University — We present a compact, fiber-based mid-infrared comb source tunable across the 9.5 to 15  $\mu\text{m}$  region. The system begins with a single erbium fiber laser (1550nm) coupled into a 25 m length of polarization maintaining telecommunication fiber. The incident intensity is sufficient to launch a soliton within the first meter of fiber, which is then coherently red-shifted as it co-propagates with the residual laser pulse. The two pulses are then mixed in a nonlinear crystal to create mid infrared light by difference frequency generation (DFG). As the soliton red-shift is proportional to both input power and fiber length, the soliton center wavelength, and thus the DFG center wavelength, can be continuously tuned. The mid infrared power is linearly proportional to the 1550nm pump power, allowing power scaling using standard telecom amplifiers. Design parameters and experimental results will be discussed.

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