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MIIPS® Application Notes

Sub-9fs pulses from an ytterbium fiber laser

Ultrafast fiber lasers are gaining popularity because of their compact size, high reliability and excellent mode quality. To obtain even shorter pulse duration, PCF fiber generated supercontinuum has become a promising approach. However, the resulting pulses need to be compressed. BSI's proprietary MIIPS® [1, 2] technology automatically measures and compresses the pulses. In this application note [3], a 220-fs High-Q Ytterbium laser was used to pump a photonic crystal fiber (PCF). The resulting supercontinuum pulses were measured and compressed using a MIIPS® Box 640 pulse shaper.

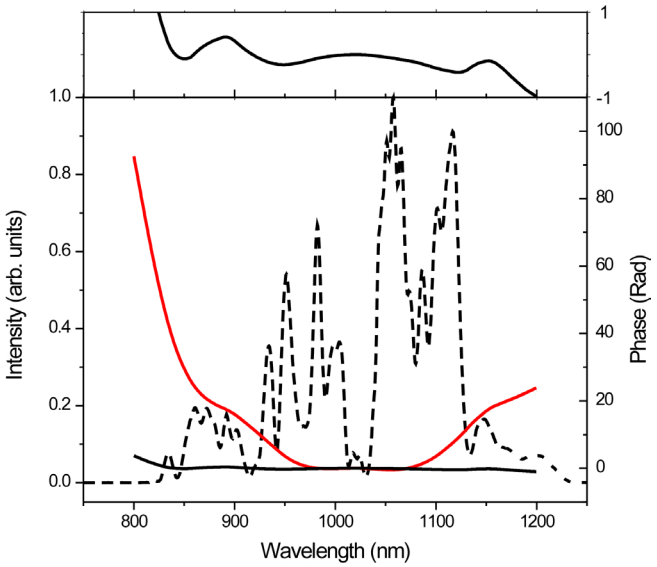

Fig. 1. Phase characterization and compensation results. The dashed line represents the fundamental spectrum of the supercontinuum from the PCF. Red solid line shows the measured phase distortion and the black solid line is the residual phase after compensation. (Top) a zoom-in version of residual phase. (Courtesy of Haohua Tu and Stephen Boppart, Biophotonics Imaging Laboratory, University of Illinois at Urbana-Champaign)

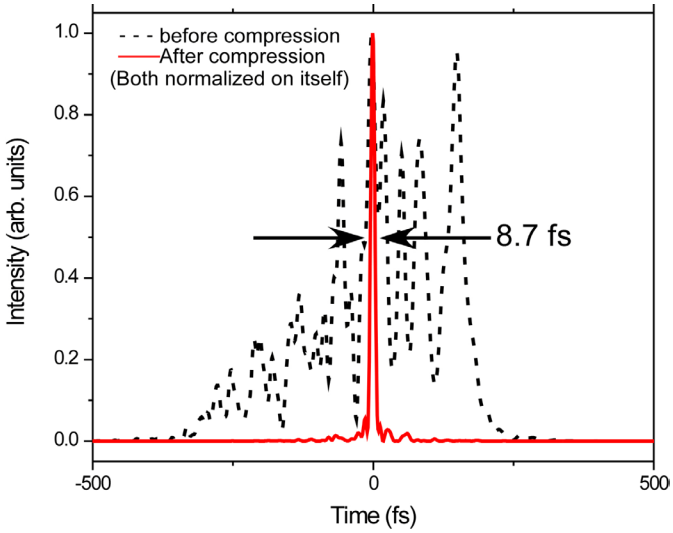

Fig. 2. Calculated temporal profile of the pulses before and after MIIPS® compression. The actual intensity of the temporal profile before compression is more then 2 orders of magnitude less. (Courtesy of Haohua Tu and Stephen Boppart, Biophotonics Imaging Laboratory, University of Illinois at Urbana-Champaign)

References

[1] V. V. Lozovoy, I. Pastirk, and M. Dantus, Opt. Lett. **29**, 775 (2004).
[2] B. Xu, J. M. Gunn, J. M. D. Cruz, V. V. Lozovoy, and M. Dantus, , J. Opt. Soc. Am. B **23**, 750 (2006).
[3] The data shown was obtained from Prof. Stephen Boppart's Biophotonics Imaging Laboratory at the University of Illinois at Urbana-Champaign, the day of installation of MIIPS® Box 640 PA (Feb 2010).