

Increasing the repetition rate of electro-optic sampling setups using
the photonic time-stretch strategy:
results at SOLEIL and ANKA

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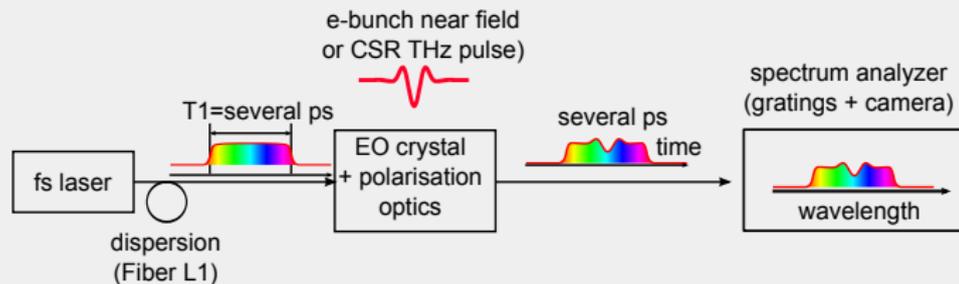
L. Manceron, J.-B. Brubach, M.-A. Tordeux, J.-P. Ricaud, L. Cassinari, M.
Labat, M.-E. Couprie, P. Roy
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A. Borysenko, N. Hiller, A.-S. Mueller, P. Schönfeldt, J. Leonard Steinmann
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Single-shot electro-optic sampling using spectral encoding

Time to spectrum conversion



+ single-shot, pico/sub-picosecond resolution

- repetition rate limited by camera acquisition rate

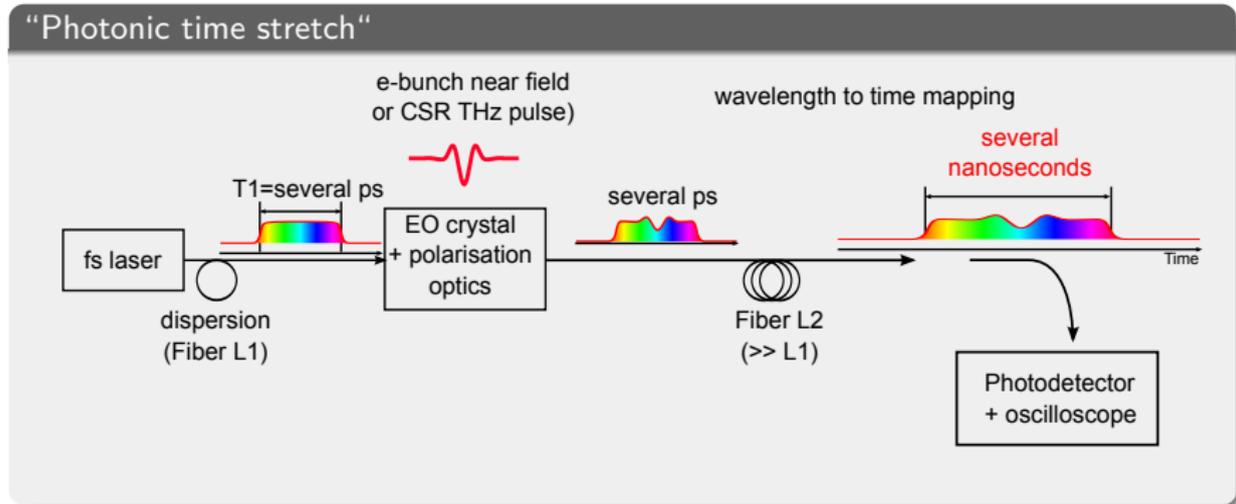
First demonstration (THz pulses): Jiang and Zhang, Appl. Phys. Lett. 72, 1945 (1998)

Electron bunch: Wilke et al., PRL 88, 124801 (2002)

CSR pulses (SLS): F. Mueller et al. PRSTAB 15, 070701 (2012)

Inside a storage ring (ANKA): N. Hiller et al., MOPME014, Proc. IPAC'13, Shanghai, China (2013).

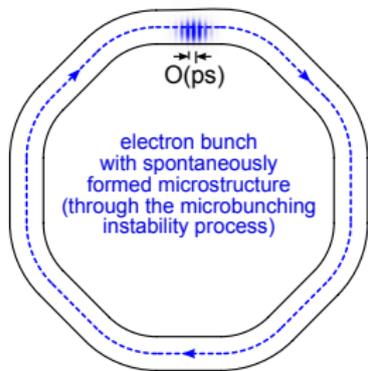
Upgrade to high repetition rate?



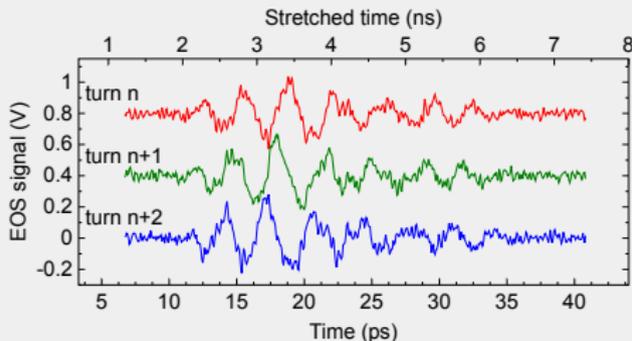
[Coppinger et al., IEEE Transactions on Microwave Theory and Techniques, 47, 1309 (1999)]

Experimental study of the microbunching instability at SOLEIL and ANKA

→ turn-by-turn recordings of the e-bunch microstructure in storage rings



CSR THz pulses (SOLEIL, 1 MHz rep. rate)



E. Roussel et al.,
Scientific Reports 5,
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e-bunch near field (ANKA, 3.7 MHz rep. rate)

