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A new approach to femtosecond level intrinsic synchronization between accelerators and external laser systems

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The timing jitter between accelerator-based light sources and external laser systems is nowadays the critical limit for the achievable temporal
resolution in ultrafast time-resolved experiments at 4th generation light sources such as superradiant terahertz (TELBE) facilities or X-FEL's. In
this work we demonstrate the proof-of-principle experiment. It was experimentally shown that our scheme allow us to compress timing jitter
between two laser systems by 2 orders of magnitude, from 2ps to 15fs by utilizing laser induced single cycle THz pulses as gate signal based on
electro-optic slicing.

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