Supplemental Information to "Dispersive temporal holography for single-shot recovering comprehensive ultrafast dynamics"

Wenchao Wang, Tianhao Xian, Mengjie Zhang and Li Zhan

State Key Laboratory of Advanced Optical Communication Systems and Networks, Department of Physics and Astronomy, Shanghai Jiao Tong University, Shanghai 200240, China.

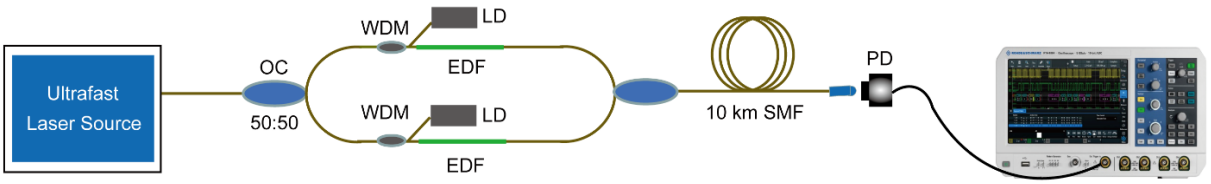

Fig. S1. Experimental setup of event 1.

OC: optical coupler. WDM: wavelength division multiplexer. EDF: Er-doped fiber. LD: laser Diode, centered at 980 nm. SMF: standard single mode fiber. PD: Photodetector. The ultrafast laser source is a Er-doped fiber laser mode-locked via nonlinear polarization rotation technology and delivers ~40nm parabolic pulse centered at 1.57 mm. The 10km SMF is the dispersive medium to achieve time stretching. Finally, the outputs are recorded by an oscilloscope.

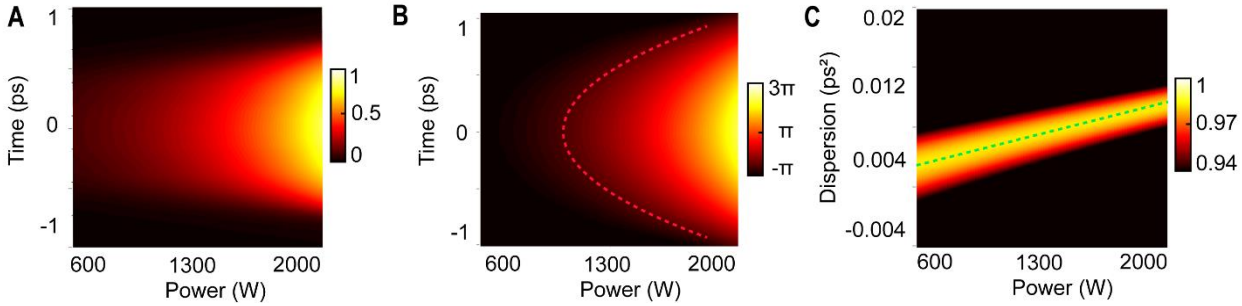

Fig. S2. Numerical simulation of event 1.

(**A**) The pulse waveforms. (**B**) The phase map. (**C**) The chirp map. The simulation parameters are set to be consistent with the experiment.

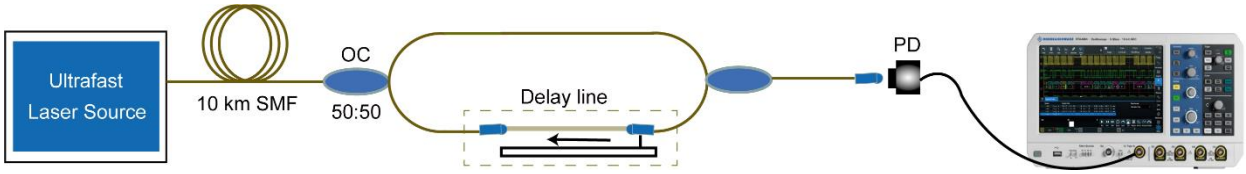

Fig. S3. Experimental setup of event 2.

The delay line is a commercial optical delay line and it is motor controlled.

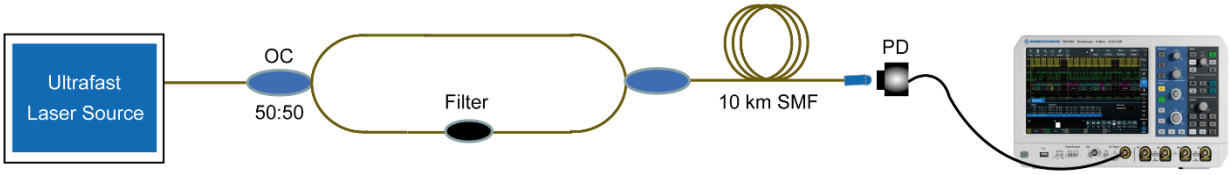

Fig. S4. Experimental setup of event 3.

The filter used is a coarse wavelength division multiplexer centered at 1570nm. From reflect to the common port, the center 13nm can be filtered.

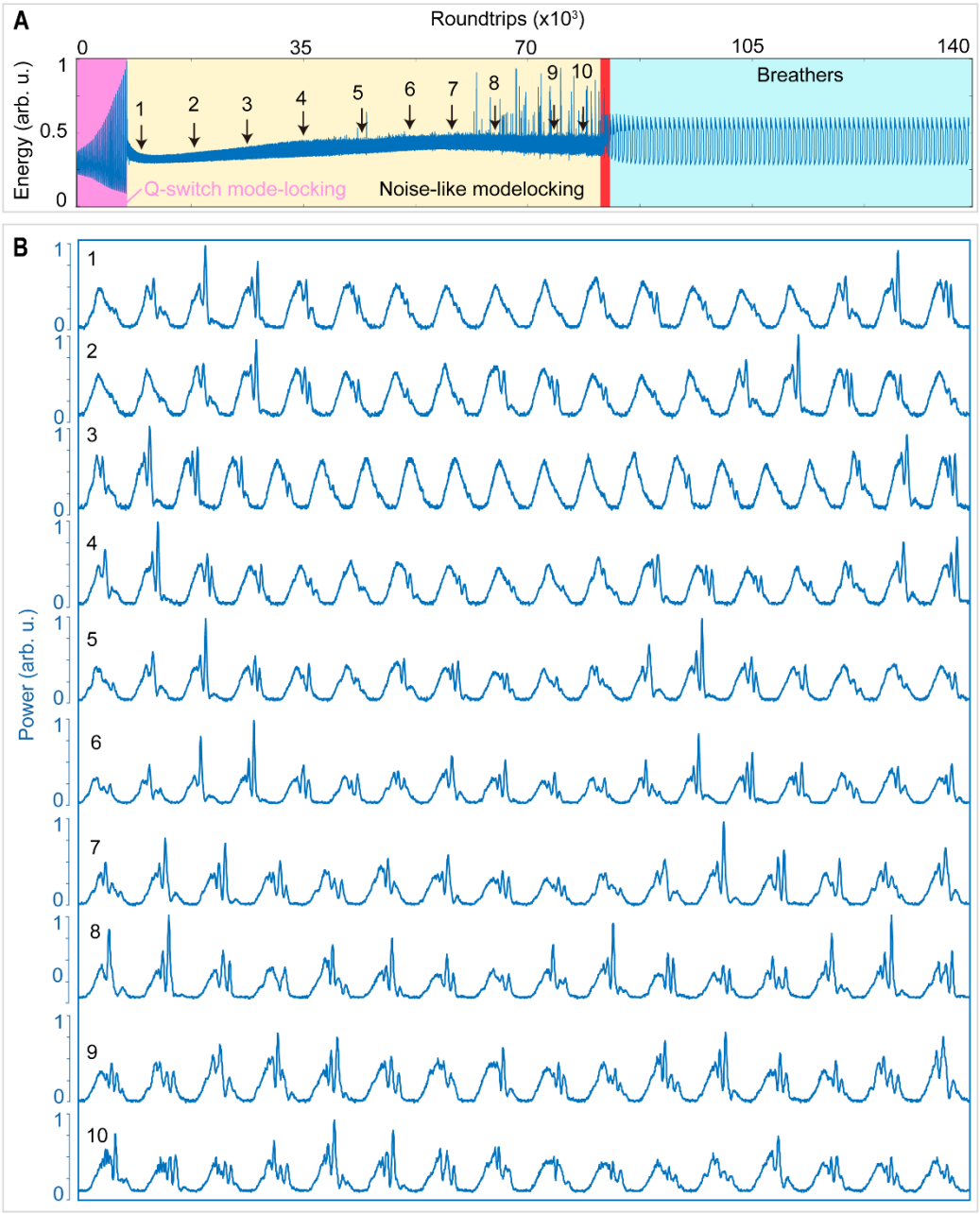

Fig. S5. Periodic spectral evolutions at the noise-like regime, recorded by DFT.

(**A**) The single pulse energy of the whole build-up process. (**B**). Selected successive spectrum, corresponding to the marks (1-10) in Fig. S5. A.