Dynamics of noise-like pulsing at sub-ns scale in a passively mode-locked fiber laser.

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Abstract.

We report an original noise-like pulse dynamics observed in a figure-eight fiber laser, in which fragments are continually released from a main waveform that circulates in the cavity. Particularly, we report two representative cases of the dynamics: in the first case the released fragments drift away from the main bunch and decay over a fraction of the round-trip time, and then vanish suddenly; in the second case, the sub-packets drift without decaying over the complete cavity round-trip time, until they eventually merge again with the main waveform. The most intriguing result is that these fragments, as well as the main waveform, are formed of units with sub-ns duration and roughly the same energy..