



Fig. 4. (a) The simulated evolutions of pulse duration and spectral width along the cavity (the experimental output and monitor ports are indicated with grey lines), the simulated output (b) spectrum (blue real line, the black dashed line is experimental spectrum), (c) pulse (red line) and its Gaussian fitting (black dashed line).

5. Conclusions

We have demonstrated sub-100 fs pulse generation at 1.5 μm from a mode-locked erbium-doped fiber laser by using a 45°-tilted fiber grating device. The utilization of 45°-tilted fiber grating with the unique polarization property renders a compact and integrative all-fiber configuration. The dispersion management with net normal dispersion leads to the operation of dissipative stretch-pulse. To the best of our knowledge, the output pulse with pulse duration of 90 fs is the shortest pulse from fiber lasers using fiber grating for mode locking. This proves furthermore that the 45°-tilted fiber grating element is an effective and cost-efficient alternative for convention polarizers. The simulations agree rather well with the experimental results.

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