

example, future studies will pursue the use of this all-fiber configuration in all-normal dispersion mode locked fiber lasers [19-21] to achieve high pulse energies.

4. Conclusions

In conclusion, we have experimentally demonstrated a passively mode-locked erbium doped fiber laser using a 45°-TFG as an in-fiber polarization element. 600 fs mode-locked pulses have been obtained with energy ~1 nJ. The simplicity of UV inscription allows producing highly repeatable gratings at low cost and the 45°-TFG can be directly written into compatible fiber for the laser cavity. In our work, the photosensitive fiber used is a commercial product which has mode-field optimization for splicing with telecom fibers and comparable dispersion parameters, allowing for easy performance optimization in all-fiber formats. The use of a 45°-TFG as an in-fiber polarizer in a mode-locked fiber laser could provide several advantages when compared to current mode-locked fiber lasers using bulk polarizers, including low insertion loss, high integrability and less temperature sensitivity.

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