

Abstract Submitted
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Carbon Nanotube- Polyvinylalcohol Composite Film as Nonlinear Optical Device: Application to Femtosecond Mode-Locked Fiber Laser MADOKA TOKUMOTO, ALEKSEY ROZHIN, YOUICHI SAKAKIBARA, National Institute of Advanced Industrial Science and Technology (AIST), YOHJI ACHIBA, Tokyo Metropolitan University, HIROMICHI KATAURA, National Institute of Advanced Industrial Science and Technology (AIST) — Saturable absorption of single-wall carbon nanotubes (SWNTs) in near-infrared region [1] is very promising as a passive mode-locker for pico- or subpicosecond pulsed Er-doped fiber lasers [2]. In this work, we fabricated SWNT/polyvinylalcohol (PVA) nanocomposite self-standing films [3] for saturable absorption devices, and used as a mode-locker for Er-doped fiber short pulse lasers. We integrated a 35- μm -thick SWNT/PVA composite film into a conventional FC/PC fiber connection adaptor, where the film is sandwiched by a pair of fiber ferrules. A ring cavity fiber laser inserted with the SWNT/PVA saturable absorber operated very easily in mode-locked short pulse mode with a pulse width as short as 210 fs, which, to our knowledge, is the shortest in this class of lasers using carbon nanotube saturable absorbers. This result demonstrates that the SWNT/PVA composite film is very promising as a passive mode-locker for femtosecond Er-doped fiber lasers. [1] Y. Sakakibara et al.: Jpn. J. Appl. Phys. 42 (2003) L494. [2] S. Y. Set et al.: OSA Trends in Optics and Photonics Vol.86, Optical Fiber Commun. Conf., Tech. Dig., Postconf. Ed., pd44. [3] A. G. Rozhin et al.: Thin Solid Films 464-465 (2004) 368.

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