

Abstract Submitted
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Silica Nanowire Growth on Photonic Crystal Fiber by Pulsed Femtosecond Laser Deposition NICHOLAS LANGELLIER, CHIH-HAO LI, GABOR FURESZ, ALEX GLENDAY, DAVID PHILLIPS, HUILIANG ZHANG, Harvard-Smithsonian, GUOQING NOAH CHANG, FRANZ KAERTNER, MIT, ANDREW SZENTGYORGYI, RONALD WALSWORTH, Harvard-Smithsonian — We present a new method of nanowire fabrication using pulsed laser deposition. An 800 mW 1 GHz femtosecond Ti:Sapphire laser is guided into a polarization-maintaining photonic crystal fiber (PCF). The PCF, with a core tapered to 1.7 micron diameter, converts femtosecond laser pulses centered at 800 nm into green light with a spectrum down to 500 nm. The PCF is enclosed in a cylindrical tube with glass windows, sealed in a class 100 clean room with silicone-based RTV adhesive. The high power of each laser pulse in a silica-rich environment leads to growth of a silica nanowire at the output end of the PCF. SEM analysis shows that the nanowire is 720 nm in diameter and grows at a rate of about 0.6 $\mu\text{m/s}$. Details of nanowire performance along with potential applications will be presented.

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