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Title:	Ablation of silicon and ultrathin fibers using single femtosecond pulse
Authors:	Sidhu, M.S. (/jspui/browse?type=author&value=Sidhu%2C+M.S.) Singh, K.P. (/jspui/browse?type=author&value=Singh%2C+K.P.)
Keywords:	Silicon Ultrathin fibers Femtosecond pulse
Issue Date:	2019
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Citation:	Indian Journal of Physics, 93(12), pp.1619–1624.
Abstract:	We exploit the nonlinear multiphoton interaction of a few-cycle femtosecond (fs) pulse with viscoelastic microfibers in order to produce nanoscale grooves on its surface. The single fs pulse has been extracted from 1 kHz pulse train by double-shutter gating technique by placing two mechanical shutters in the beamline and simultaneously triggering them with a controlled delay. With adjustment of the time delay between two shutters, a small transmission window has been created to cleanly extract a single or desired number of pulses. We found that the single-pulse ablation threshold for microfiber is 1 J/cm ² while for absorbing surfaces like crystalline Si is 0.01 J/cm ² . Precise diffraction unlimited ablation of materials opens a route to process nanoscale waveguides, microfluidic devices to isolate cells or macro-molecules.
URI:	https://link.springer.com/article/10.1007%2Fs12648-019-01419-5 (https://link.springer.com/article/10.1007%2Fs12648-019-01419-5) http://hdl.handle.net/123456789/1654 (http://hdl.handle.net/123456789/1654)
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