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Silicon nano-structures for dielectric laser accelerators: fabrication, simulation and testing

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Dielectric laser accelerators (DLAs) have proven to be good candidates for miniaturized particle accelerators. Acceleration gradients in the range of GeV/m have already been shown. In this work we show the field distribution simulations and error tolerances for different DLA geometries when they are powered with short pulses of infrared laser beams. We also discuss the fabrication and testing of silicon nano-structures that have been constructed via the conventional techniques of e-beam lithography and reactive ion etching.

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