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Numerical study of fabrication tolerances for dielectric laser acceleration (DLA) structures

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DLA structures are five to six orders of magnitude smaller than conventional radio frequency accelerating structures. Precision of the microfabrication process will be crucial for the construction of a practical DLA device. In this study, finite-element method models are constructed for selected DLA structures to show what level of precision, in terms of a fraction of the driving wavelength, is required. Some speculation on the possible tuning of imperfect structures will also be presented.

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