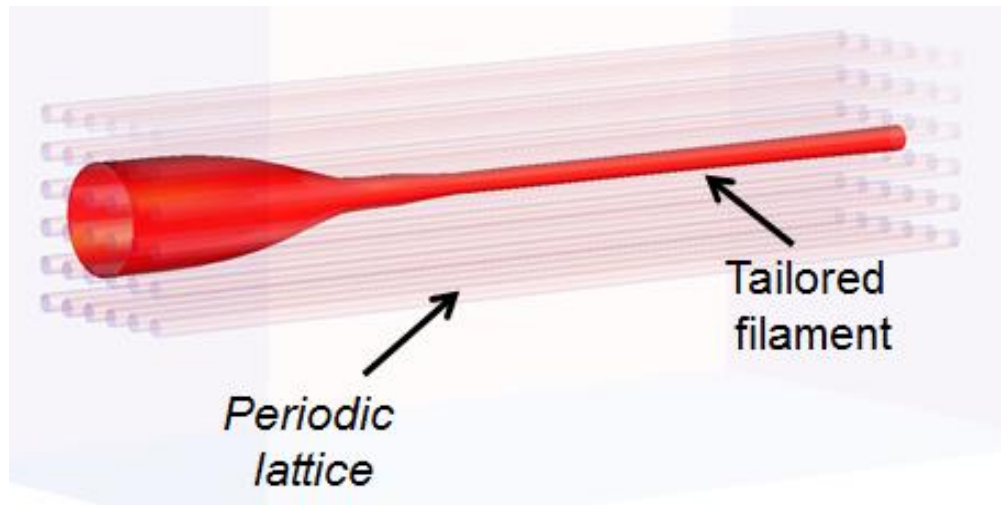


Lattice Filaments



In a recent work [P. Panagiotopoulos, N. K. Efremidis, D. G. Papazoglou, A. Couairon, and S. Tzortzakis, “Tailoring the filamentation of intense femtosecond laser pulses with periodic lattices”, [Phys. Rev. A 82, 061803\(R\)\(2010\)](#)], inspired by the waveguide arrays and optically induced lattices used to control the attributes of solitons, we investigate the use of lattices to control the features of intense femtosecond laser filaments. In this way, we demonstrate a propagation regime of intense lattice solitons bridging the field of spatial solitons with that of filamentation. By tuning the parameters of the lattice, we can tailor the filaments’ uniformity, peak intensity, plasma density, beam width and total length. Our approach opens up the way for extensive control of the filament attributes in the spatial and temporal domain, with a big potential impact to various applications utilizing filaments, such as THz generation or attosecond pulse generation, among many others.

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