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Recent developments in dielectric laser acceleration

Wednesday, 18 September 2019 11:00 (40 minutes)

Dielectric laser acceleration has made tremendous progress. We will give an overview of recent results, most of them obtained in the Gordon and Betty Moore Foundation-funded Accelerator on a Chip International Program, ACHIP. Highlight results include: acceleration gradients of around 1 GeV/m; the generation of electron pulse trains with attosecond bunchlet duration via optical near field or via free space ponderomotive interaction; acceleration powered by on-chip photonic waveguides; laser-driven electron lensing using dielectric structures; electron guiding by alternating phase focusing, allowing continued acceleration of electrons over, in principle, infinitely long structures with little particle loss. The current status on the way to a particle accelerator on a photonic chip will be given, as well as the status of dielectric laser acceleration experiments at the high energy beam facilities.

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