

P4.2016 Surface plasmon excitation and electron acceleration by a high-intensity laser pulse with wavefront rotation

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See the full abstract here:

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Recently, Pisani et al. [1] have shown the possibility of generating nearly single-cycle (less than 4 fs) propagating surface plasmons at the micro-structured surface of a grating target by a laser pulse with wavefront rotation. Since the surface plasmon can be excited when the grating is irradiated at a specific angle, using wavefront rotation the resonance condition holds for only a fraction of the laser duration, resulting in a few-cycle surface plasmon. Extending this concept to the relativistic regime of interaction [2] is of interest for the development of surface plasmon-enhanced ultrashort sources of high-energy electrons and XUV harmonic photons [3]. Using the open-source Particle-In-Cell (PIC) code SMILEI [4], we performed fully self-consistent kinetic simulations of the interaction of relativistically intense laser pulses with wavefront rotation, aiming at characterizing and optimizing the generation of extremely ultrashort high-field surface plasmons and the related acceleration of electron bunches.

References

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