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Relativistic Oscillating Gyromagnetic Effects in Ultra-intense Laser-Matter Interaction ROBIN MARJORIBANKS, Department of Physics, and Institute for Optical Sciences; University of Toronto, CANADA, JEAN-PAUL GEINDRE, LULI, Ecole Polytechnique, FRANCE, PATRICK AUDEBERT, LULI, Ecole Polytechnique, FRANCE — We demonstrate that in ultra-intense ultrafast laser-matter interaction, the interplay of laser-induced oscillating space-charge fields with laser E- and B-fields can strongly affect whether the interaction is relativistic or not: stronger laser fields may not in fact produce more-relativistic plasma interactions. We show that there exists a regime of interaction, in the relation of laser intensity and incident angle, for which the Brunel effect of electron acceleration is strongly suppressed by AC gyromagnetic fields, at a frequency different from the laser field. Analytically and with 1.5-D PIC code modelling, we show that from gyromagnetic effects, even in the absence of usual JxB second-harmonic contributions, there is strong impact on the harmonic emission and on the generation of attosecond pulses.

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