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Generation of a Strong Terahertz Radiation by Counter-Propagating Laser Pulses in a Magnetized Plasma MIN SUP HUR, MYUNG-HOON CHO, YOUNG-KUK KIM, UNIST — A novel scheme of terahertz emission from a laser-plasma system was studied by theory and PIC simulations. In this new scheme, two counter-propagating laser pulses collide in a magnetized plasma. The strong ponderomotive force of the colliding pulses induces longitudinal current, which again is partially converted to a transverse one via the external magnetic field. This current actually plays the role radiating antenna. Since the ponderomotive force of the colliding pulses is generally much stronger than that from the single pulse, the intensity of the terahertz emission from the suggested scheme can be enhanced by tens of times from the single-pulse-driven Cherenkov wake scheme. Theoretically it was found that the terahertz amplitude scales with the P-square of the driving pulse instead of just P. More than that, an interesting physics of the electric field diffusion near the cutoff was observed in the simulations and fully described theoretically. One direct result of such a driven-diffusion of the electric field is the growth of the central field, leading to increased terahertz emission with the plasma density gradient.

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