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Quasi-Static Magnetic Filed Generation in Interaction of Circularly Polarized Laser Pulses with Underdense Plasma NEDA NASERI, Department of Physics-University of Alberta-Edmonton-Canada, VALERY YU. BYCHENKOV, Lebedev Physics Institute- Moscow, Russia, WOJCIECH ROZMUS, Department of Physics-University of Alberta, Edmonton, Canada — The excitation of quasi-static axial magnetic field by circularly polarized laser pulses in plasma channels due to inverse Farday effect is studied. The distribution of axial quasi-static magnetic filed is found numerically for different laser intensity and plasma channel distributions. To check that magnetic field changes its sign with change of left to right circular polarization, we performed 3D PIC simulations with right-hand and left-hand circularly polarized laser light and found that the excited magnetic filed due to inverse Faraday effect changes its sign with the change of polarization as predicted from theory. The distribution of quasi-static axial magnetic filed is found numerically by adopting the distribution of the laser intensities and density channels from our 3D simulations and compared with quasi-static magnetic filed calculated from the simulation.

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