

PARAMETRIC DEPENDENCE OF TWO-PLASMON DECAY IN HOMOGENEOUS PLASMA

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Abstract. A hydrodynamic model of two-plasmon decay in a homogeneous plasma slab near the quarter-critical density is constructed in order to improve our understanding of the spatio-temporal evolution of the daughter electron plasma waves in plasma in the course of the instability. The scaling of the amplitudes of the participating waves with laser and plasma parameters is investigated. The secondary coupling of two daughter electron plasma waves with an ion-acoustic wave is assumed to be the principal mechanism of saturation of the instability. The impact of the inherently nonresonant nature of this secondary coupling on the development of two plasmon decay is researched and it is shown to significantly influence the electron plasma wave dynamics. Its inclusion leads to nonuniformity of the spatial profile of the instability and causes the burst-like pattern of the instability development, which should result in the burst-like hot-electron production in homogeneous plasma.