

Abstract Submitted  
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**Multidimensional autoresonant three-wave interactions**<sup>1</sup> LAZAR FRIEDLAND, ODED YAAKOBI, Hebrew University of Jerusalem — The theory of autoresonant three-wave interactions is generalized to more than one space and/or time variation of the background medium. In the most general case, the three waves propagate in a four-dimensional (4D) slowly space-time varying background, with an embedded 3D linear resonance hypersurface, where the linear frequency and wave-vector matching conditions of the three waves are satisfied exactly. The autoresonance in the system is the result of weak nonlinear frequency shifts and nonuniformity in the problem and is manifested by satisfaction of the nonlinear resonance conditions in an extended region of space-time adjacent to the resonance surface despite the variation of the background. The threshold condition for autoresonance is found. Asymptotic description of the autoresonant waves far away from the resonance surface is obtained. The theory is illustrated and tested in 2D numerical simulations. An application to stimulated Raman scattering in a nonuniform, time-dependent plasma case is discussed.

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