

Abstract Submitted
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Autoresonant BGK modes¹ PAVEL KHAIN, LAZAR FRIEDLAND,
Hebrew University of Jerusalem — Resonant wave interactions play a major role in
plasmas and other nonlinear media. The interacting waves may exhibit autoreso-
nance, i.e. a continuous nonlinear phase-locking despite variation of system param-
eters [1]. We present a kinetic wave autoresonance paradigm, where a driven BGK
mode is excited by slow variation of the driving wave frequency. We assume a flat-
top initial electron distribution, drive the system by a slowly varying ponderomotive
wave. Initially, the drive's phase velocity is outside the velocity distribution, so the
electrons do not experience Cherenkov resonance. Later, as the driving frequency
decreases, a stable phase-space hole is formed and, under certain conditions, remains
phase-locked with the drive [2,3]. The electrostatic field associated with this struc-
ture comprises the autoresonant BGK mode. We study the problem analytically
and numerically within the Vlasov-Poisson system and use the Whitham's averaged
variational principle [4] to describe the adiabatic evolution of the BGK mode. [1]
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Lazar Friedland
Hebrew University of Jerusalem

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