

“Vlasov Equation” and “Landau Damping”

1. Ландау Л.Д. Кинетическое уравнение в случае кулоновского взаимодействия. Phys.Zs.Sowjet. 10, 154 (1936)

(Landau paper on Coulomb collisions in kinetic equation)

2. Власов А.А. О вибрационных свойствах электронного газа. ЖЭТФ 8, 291 (1938)

(Vlasov’s first paper on plasma waves)

$$\omega^2 = \omega_p^2 + \frac{3k_B T}{m} k^2, \quad (8)$$

$$\delta f = \frac{e\bar{E}}{i(\bar{k}\bar{v} - \omega)} \frac{\partial f_0}{\partial \bar{p}} \quad (3)$$

3. L.D. Landau: ЖЭТФ 16, 374 (1946). Journ. Phys. USSR 10, 25 (1946)

(“Landau Damping” paper)

4. Гинзбург В.Л., Ландау Л.Д., Леонтович М.А., Фок В.А. О несостоятельности работ А.А.Власова по обобщенной теории плазмы и теории твердого тела. ЖЭТФ 16, 246 (1946)

(V.Ginzburg, L.Landau, M.Leontovich, V.Fok

“On inconsistency of Vlasov works on generalized theory of plasma and solid states”

Landau and “Landau damping”

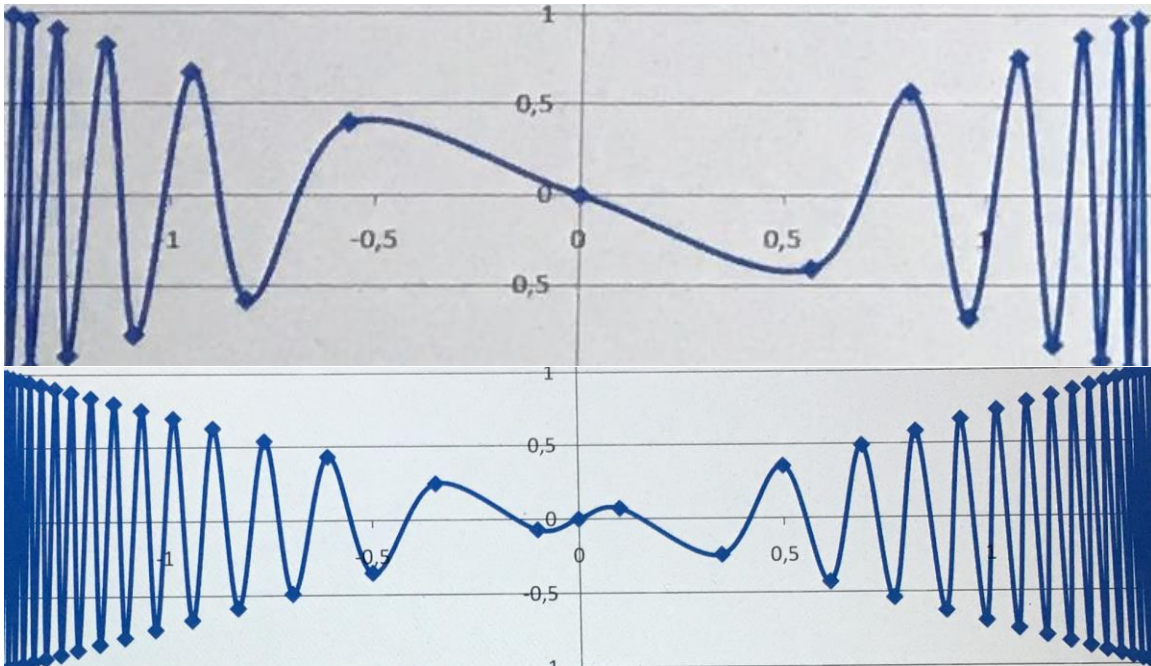
H-theorem as applied to Landau damping and
Entropy paradox

Is Landau damping reversible

Redefinition of Entropy in this case

Phase mixing and Kolmogorov entropy

Physical picture of phase mixing for trapped
particles



The Thought Experiment on Irreversibility of Landau Damping

(Adiabatic switch on and switch off of the resonant plasma wave)

4 different scenarios: 1. Wave catches particle then releases it with the same velocity 2. ...but releases it forward (accelerated) 3 and 4 when particle is catching the wave.