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Interaction of plasma oscillations with a background ion density perturbation SAYAK BOSE, MANJIT KAUR, P.K. CHATTOPADHYAY, J. GHOSH, Y.C. SAXENA, Institute for Plasma Research — In a quasineutral plasma, electrons undergo collective oscillations, known as plasma oscillations, when perturbed locally. The oscillations propagate due to finite temperature effects. However, the wave loses its coherence in an inhomogeneous plasma (phase mixing) because of the dependence of plasma oscillation frequency on plasma density [1]. Phase mixing is characterized by transfer of energy from wave to particles. For detailed experimental investigation of the above mentioned phenomena a new device, Inverse Mirror Plasma Experimental Device (IMPED) [2], has been designed and fabricated. The machine produces uniform plasma, $L_{uniform} \sim 120\ cm$, with quiescence, $\delta n/n \sim 0.2\%$, in argon at filling pressure of $\sim 10^{-4}\ mbar$ and axial magnetic field of $B_{main} \sim 900\ G$. Plasma oscillations excited in the presence of a background ion density perturbation clearly showed that the power in the coherent plasma oscillations decreased significantly with the increase in the amplitude of the ion density perturbation. The experimental details and results are presented.

[1] J. Dawson Phys. Rev. 113, 383 (1959).
[2] Bose *et al.* J. Plasma. Phys. 81, 345810203 (2015).

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