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Phase-mixing of electrostatic modes in pair-ion plasma SOURAV PRAMANIK, Saha Institute of Nuclear Physics, Kolkata, CHANDAN MAITY, Vivekananda Mahavidvalava, Haripal, Hooghly-712405, India., NIKHIL CHAKRABARTI, Saha Institute of Nuclear Physics, Kolkata — In a homogeneous plasma, an excited electrostatic mode can face breaking even if the perturbation amplitude is kept well below the threshold value through the process of phasemixing. In various physical situations (for example inhomogeneous ion density background, inhomogeneous magnetic field, relativistic effects etc), associated characteristic mode frequency of the oscillation becomes space dependent and the mode is called phase-mixed. As the phase-mixed mode evolves through the space and time, particles located at different positions oscillate with different local frequencies. In next scenario, the phase difference between two adjacent oscillators begins to increase secularly with time and, finally, trajectories of the adjacent oscillators start to intersect their paths. It costs a gradual loss in the phase coherence of the constituting oscillators and eventually the relevant mode breaks. The appearance of spiky density profile signifies the occurrence of phase mixing. In our works, phase-mixing process has been studied in pair ion plasmas (fullerene-ion plasma, electron-positron plasma) and the effects of different parameters (like temperature, external magnetic field, ion concentration) on the phase-mixing process have been explored analytically.

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