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Colliding Laser-Produced Plasmas on LaPD ANDREW COLLETTE, WALTER GEKELMAN, UCLA — The expansion and interaction of dense plasmas in the presence of a magnetized background plasma is important in many astrophysical processes. We describe a series of experiments which involve the collision of two dense (initially $n > 10^{15}\text{cm}^{-3}$) laser-produced plasmas within an ambient, highly magnetized background plasma at the UCLA Large Plasma Device facility. These plasmas form diamagnetic cavities in which a large fraction of the background field (600G) has been expelled. Fast (3ns) camera observations of this experiment recorded complicated structures, including coherent corrugated structures on the bubble surfaces. The data hint at the presence of turbulence in the interaction. In order to directly investigate the evolution of the magnetic field, we developed a novel diagnostic system composed of small (1-mm) 3-axis differential magnetic field probes, in conjunction with a vacuum ceramic motor system capable of submicron positioning accuracy. Using an ensemble of magnetic field data from fixed and movable probes, we calculate the cross-spectral function, from which the dominant modes and ultimately the dispersion relation of waves in this region may be deduced.

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