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**Waves and Fine Structure in Expanding Laser-Produced Plasmas**[1] ANDREW COLLETTE, WALTER GEKELMAN, University of California, Los Angeles — The behavior of expanding dense plasmas has long been a topic of interest in space plasma research, particularly in the case of expansion within a magnetized background. Previous laser-plasma experiments at the UCLA Large Plasma Device have observed the creation of strong ($\frac{\Delta B}{B} > 50\%$) diamagnetic cavities, along with large-scale wave activity and hints of fine-scale structure. A new series of experiments conducted recently at the LaPD performs direct measurement of the fields inside the expanding plasma via a novel 2D probe drive system. This system combines small-scale (0.5mm-1mm) magnetic and electric field probes with high-accuracy vacuum ceramic motors, to allow measurement of the plasma volume over a 2000-point grid at 1mm resolution. The data reveal both coherent high-amplitude waves associated with the formation of these magnetic features, and complicated small-scale structure in both the magnetic field and floating potential. In addition, we will present correlation techniques using multiple independent B and E field probes. This reveals behavior of turbulent, non-phase-locked phenomena. Both the case of a single expanding plasma and two colliding plasmas were studied.

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