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Study of Plasma Waves/Electromagnetic Waves/Electron Beam Interactions ARNESTO BOWMAN, RONALD WILLIAMS, Florida A&M University — Plasma waves are capable of producing accelerating electric fields greater than what is capable by conventional radiofrequency accelerators. In order to understand plasma waves better non-intrusive diagnostics are needed. Intersecting a low energy electron beam perpendicular to a plasma wave has been suggested as a non-disturbing diagnostic. Simulations conveying an electron beam traversing a plasma wave will be presented. The plasma wave was created using the beat-wave technique; therefore, an electron beam traversing residual laser fields will be included in the analysis. Inherent electron beam properties such as spot size and beam energy will be examined. This will be accomplished by crossing a low energy Helium Neon laser with the previously mentioned electron beam. These simulations are used to imitate a laboratory experiment. The experiment employs a 5 Joule CO₂ laser to create the plasma wave and 5-50 keV electron beam to diagnose the plasma wave.

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