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Determination of the electric field and its gradient in the plasma sheath using floating microspheres M.R. KATSCHKE, K.D. WELLS, T.E. SHERIDAN, Physics, Ohio Northern University — The electric field and its gradient in an rf plasma sheath are determined experimentally. Either two or three uniform, dielectric microspheres are suspended in the plasma near the sheath edge. The center-of-mass and breathing frequencies for the particle clusters are found by measuring the resonance curves for horizontal oscillations driven by amplitude modulating the rf power. The particle charge and plasma Debye length are inferred from the ratio of these resonance frequencies. Knowledge of the particle mass then allows the electric field at the position of the particles to be found, while the electric field gradient is determined by measuring the vertical resonance frequency.

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