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Steep Capillary Waves in Electrified Fluid Sheets

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Capillary waves on fluid sheets are computed in the presence of uniform electric fields. The fields are acting vertically or horizontally with respect to the undisturbed configuration. Both conducting and nonconducting fluids are considered. The effects of viscosity and compressibility are neglected. Traveling waves of arbitrary amplitudes are calculated and the effects of the electric fields are studied. Numerical solutions are obtained by boundary integral equation methods. Analytic solutions based on long wave asymptotics are also presented. Two dimensional and axisymmetric configurations are studied.

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