

Electrohydrodynamic Instability and Breakup of a Liquid Jet

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High-speed imaging reveals capillary instabilities in a laminar liquid jet ($Re \sim 1000$) subjected to a divergent electric field ($|E| \sim 2 \cdot 10^5 \text{ V/m}$).

A helical instability (pictured as a time sequence on the left) is observed to result in elongated filaments that break up into droplets with a bimodal size distribution.

The electric field additionally accelerates the resulting droplets spreading them radially (center picture). The combination of fluid and electrohydrodynamic instabilities lead to physics-rich multiscale phenomena.

