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Streaming instability at the equator of an oblately deformed drop

QUENTIN BROSSEAU, PETIA VLAHOVSKA, Brown University — Electrohydrodynamic streaming and jet formation from the conical tips formed at the poles of a highly conducting drop in strong electric field is a well known phenomenon. Here we report a novel streaming-like instability occurring with drops less conducting than the suspending medium. In a uniform DC electric field, the drop deforms into a flattened oblate (pancake-like) shape with cusped rim around the equator. The rim emits concentric threads which subsequently break up into tiny droplets forming a Saturn-like rings of droplets around the mother drop. The rate of droplet production is much larger than the classical tip-streaming and suggest a potential new route for "electroemulsification".

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