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Instability of a fluctuating membrane driven by an AC electric field JACOPO SEIWERT, Institut de Physique de Rennes, PETIA VLAHOVSKA, Brown University — We consider theoretically the stability of a biomimetic planar membrane stressed by a perpendicularly applied time-varying electric field. The membrane, which separates two fluids, is modeled as a leaky capacitor. We investigate the influence of membrane electrical properties, as well as those of the surrounding fluids, on membrane stability. Our linear stability analysis shows that unlike what happens with DC electric fields, a purely capacitive membrane can be destabilized in an AC electric field. The theory highlights that the instability originates from electric pressure exerted on the membrane.

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