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Fluctuation and dynamics of a lipid bilayer membrane under an electric field[1] YUAN-NAN YOUNG, New Jersey Institute of Technology, MICHAEL MIKSIS, Northwestern University, PETIA VLAHOVSKA, Brown University — Membrane fluctuation and dynamics under an electric field is investigated, and results show that the membrane instability and dynamics depend not only on the mismatch in conductivity and permittivity between the bulk fluids, but also on the membrane charging time. In addition, the (entropic) membrane tension is found to depend on the electric field. Lubrication theory is utilized to examine the nonlinear dynamics of a planar lipid bilayer membrane with and without electrokinetics.

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