

Abstract Submitted
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**Fluctuating Lipid Bilayer Membranes With Diffusing
Protein Inclusions: Hybrid Continuum-Particle Model**

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bara — Many proteins through their geometry and specific interactions
with lipids induce changes in local membrane material properties. This
can manifest in local stiffness variations and locally induced curvatures
that track protein location. To study such phenomena we introduce
a new hybrid continuum-particle description for the membrane-protein
system that incorporates protein interactions, hydrodynamic coupling,
and thermal fluctuations. We investigate how protein curvature and
membrane stiffness influences protein diffusion. We discuss how collec-
tive protein effects influence membrane mechanical properties, such as
the spectrum of membrane bending fluctuations and the effective elastic
bending modulus of the heterogeneous protein-lipid membrane. Finally,
we discuss possible roles of the membrane fluctuations influencing the
distribution of proteins within the membrane.

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