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Nonlinear adhesion dynamics of confined lipid membranes[1] TUNG TO, THOMAS LE GOFF, OLIVIER PIERRE-LOUIS, Univ Lyon 1 UA 442 CNRS — Lipid membranes, which are ubiquitous objects in biological environments are often confined. For example, they can be sandwiched between a substrate and the cytoskeleton between cell adhesion, or between other membranes in stacks, or in the Golgi apparatus. We present a study of the nonlinear dynamics of membranes in a model system, where the membrane is confined between two flat walls. The dynamics derived from the lubrication approximation is highly nonlinear and nonlocal. The solution of this model in one dimension exhibits frozen states due to oscillatory interactions between membranes caused by the bending rigidity. We develope a kink model for these phenomena based on the historical work of Kawasaki and Otha [2,3,4]. In two dimensions, the dynamics is more complex, and depends strongly on the amount of excess area in the system. We discuss the relevance of our findings for experiments on model membranes, and for biological systems [5].

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[4]T. Le Goff, O. Pierre-Louis and P. Politi, J. Stat. Mech. **P08004**, 1742 (2015).
[5]T. B. T. To, T. Le Goff, O. Pierre-Louis, preprint.

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