1036-76-89 **Tak S. Lo*** (tlo@ccny.cuny.edu), Levich Institute, Steinman Hall T1-M, City College of CUNY, 140th Street & Convent Avenue, New York, NY 10031, and **Joel Koplik** (koplik@sci.ccny.cuny.edu), Levich Institute, Steinman Hall T1-M, City College of CUNY, 140th Street & Convent Avenue, New York, NY 10031. *Pearling Instability of Nano-flows Confined to a Chemical Channel.*

We investigated the flow of a nano-scale incompressible liquid ridge along a chemical channel: a wetting stripe sandwiched between two non-wetting solids, using molecular dynamics simulations and finite-element continuum calculations. We find that a pearling instability develops when the height of the ridge exceeds a critical value equal to half of the width of the channel both when the liquid is static and flowing. In the flowing case, periodic bulges propagates along the channel and subsquently merge due to nonlinear effects. However, the ridge does not break up even when the flow is unstable. The challenge of this problem lies in its transient and free-surface nature. We also performed a linear stability analysis and developed a simple long-wavelength approximation which gives qualitatively consistent results. (Received January 15, 2008)