1127-35-133   **Stan Alama** and **Lia Bronsard*** (`bronsard@mcmaster.ca`), Department of Mathematics & Statistics, McMaster University, Hamilton, ON L8S 4K1, Canada, and **Rustum Choksi** and **Ihsan A Topaloglu**. *Droplet phase in a nonlocal isoperimetric problem under confinement.*

We address small volume fraction asymptotic properties of a nonlocal isoperimetric functional with a confinement term, derived as the sharp interface limit of a variational model for self-assembly of diblock copolymers under confinement by nanoparticle inclusion. We introduce a small parameter η to represent the size of the domains of the minority phase, and study the resulting droplet regime as $\eta \to 0$. A key role is played by a parameter M which gives the total volume of the droplets at order η^3 and its relation to existence and non-existence of minimizers to a nonlocal isoperimetric functional on $\mathbb{R}^3$. For large values of M, the minority phase splits into several droplets at an intermediate scale $\eta^{1/3}$, while for small M minimizers form a single droplet converging to the maximum of the confinement density. (Received January 30, 2017)