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Xiaofeng Ren* (ren@gwu.edu), 2115 G Street, NW, Washington, DC 20052, and **David Shoup** (shoup@gwu.edu), 2115 G Street, NW, Washington, DC 20052. *The impact of the domain boundary on an inhibitory system: existence and location of a half disc stationary set.*

The nonlocal geometric variational problem derived from the Ohta-Kawasaki diblock copolymer theory is an inhibitory system with self-organizing properties. The free energy of the problem is a sum of a local energy which is the perimeter of Caccioppoli sets, and a nonlocal energy given with the help of the Green's function of Poisson's equation. The system has the property of preventing an interior component of a set from drifting towards the domain boundary. This raises the question whether a stationary Caccioppoli set may have a component that touches the domain boundary. It is proved that a small, half disc like set exists as a stable stationary Caccioppoli set, where the circular part of its boundary is inside the domain and the almost flat part of its boundary coincides with part of the domain boundary. The location of this half disc depends on two quantities: the curvature of the domain boundary, and a remnant of the Green's function after one removes the fundamental solution and a reflection of the fundamental solution. When the nonlocal energy is weighted less against the local energy, the half disc stationary set appears near a maximum of the curvature; when the nonlocal energy is weighted more, the half disc appears near a minimum of the remnant function. (Received January 05, 2015)