Sarah E Tammen* (setammen@uga.edu). The Isoperimetric Problem in $\mathbb{R}^n$ with Density $r^p$. Preliminary report.

The isoperimetric problem with a density or weighting seeks to enclose prescribed weighted volume with minimum weighted perimeter. According to Gregory Chambers’ recent proof of the Log-Convex Density Conjecture, for a certain class of density functions on $\mathbb{R}^n$, isoperimetric regions are balls centered at the origin. We use similar methods of analyzing planar curves to investigate another conjecture that if $\mathbb{R}^n$ has density $r^p$, where $r$ is distance from the origin and $p > 0$, then isoperimetric regions are bounded by spheres that pass through the origin. This research is a joint project conducted by the Geometry group in the 2014 Williams College “SMALL” program and Gregory Chambers. (Received September 13, 2014)