1155-35-277 **Wesley Hamilton*** (wham@live.unc.edu), **Jeremy L. Marzuola** and **Hau-tieng Wu**. *On the behavior of 1-Laplacian Ratio Cuts on nearly rectangular domains.*

Given a connected set $\Omega_0 \subset \mathbb{R}^2$, define a sequence of sets $(\Omega_n)_{n=0}^{\infty}$ where Ω_{n+1} is the subset of Ω_n where the first eigenfunction of the (properly normalized) Neumann $p-$Laplacian $-\Delta^{(p)}\phi = \lambda_1|\phi|^{p-2}\phi$ is positive (or negative). For $p = 1$, this is also referred to as the Ratio Cut of the domain. We conjecture that, unless Ω_0 is an isosceles right triangle, these sets converge to the set of rectangles with eccentricity bounded by 2 in the Gromov-Hausdorff distance as long as they have a certain distance to the boundary $\partial\Omega_0$. We establish some aspects of this conjecture for $p = 1$ where we prove that (1) the 1-Laplacian spectral cut of domains sufficiently close to rectangles of a given aspect ratio is a circular arc that is closer to flat than the original domain (leading eventually to quadrilaterals) and (2) quadrilaterals close to a rectangle of aspect ratio 2 stay close to quadrilaterals and move closer to rectangles in a suitable metric. We also discuss some numerical aspects and pose many open questions. (Received January 16, 2020)