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Title: Total curvature and isoperimetric inequality

Abstract: If D is a domain in $\mathbb{R}^n$ the classical isoperimetric inequality states that $\mathrm{Vol}(\partial D)^n \geq n^n \omega_n \mathrm{Vol}(D)^{n-1}$, $\omega_n = \mathrm{Vol}$(unit ball), and equality holds if and only if D is a ball. As an extension of this inequality we can consider the *relative isoperimetric inequality*: Given a convex domain $C \subset \mathbb{R}^n$ and a domain $D \subset \mathbb{R}^n \sim C$, does D satisfy $\mathrm{Vol}(\partial D \sim \partial C)^n \geq \frac{1}{2} n^n \omega_n \mathrm{Vol}(D)^{n-1}$? Does equality hold if and only if D is a half ball and C is half space? We prove this inequality by deriving a total curvature estimate: If a hypersurface $S \subset \mathbb{R}^n \sim C$ is perpendicular to ∂C along ∂S, then $\int_S GK \geq \frac{1}{2}\mathrm{Vol}$(unit sphere), $GK =$ Gauss-Kronecker curvature of S. This is a joint work with Ghomi and Ritoré.