

1046-53-1898

Ralph Howard* (howard@math.sc.edu), Department of Mathematics, University of South Carolina, Columbia, SC 29208. *Variational formulas for the isotropic constant*. Preliminary report.

A bounded domain, D , of \mathbf{R}^n is in *isotropic position* iff its volume is one, its center of mass is the origin, and for some positive constant $L(D)$ (the *isotropic constant* of D)

$$\int_D x_i x_j d\text{Vol} = L(D) \delta_{ij}.$$

If D is not in isotropic position, then there is an affine map, A , of \mathbf{R}^n such that AD is in isotropic position and then define $L(D) = L(AD)$. We give variational formulas for L for as D varies over domains with smooth boundary and study the extremal domains from the point of view of differential geometry. (Received September 16, 2008)