Systematic derivations of measures of arbitrary ellipsoids

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Abstract

In this paper, systematic derivations of measures of an arbitrary ellipsoid are presented. The measures include volume, surface area and integral of mean curvature. The derivations are all performed in ellipsoidal coordinates the first time. They are systematic, simple and straightforward, no special techniques are needed. The approach can be easily extend to other measures such as Willmore energy of an ellipsoid, integrals on segments, and also to other coordinate systems or higher dimensional problems.