

Re: how to find the volume of a quadratic form?

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Assuming that A is positive definite (or else you get some kind of hyperboloid) it has a cholesky factor L (lower triangular so that $L \cdot L' = A$). Then your ellipsoid is the image of $\{ x \mid x' \cdot x = c \}$ (ie the sphere of radius \sqrt{c}) under $\text{inv}(L)$. So its volume is $\det(\text{inv}(L))$ times the volume of the sphere, Note that $\det(\text{inv}(L)) = 1/\det(L)$ (= $1/\sqrt{\det(A)}$), and L being lower triangular, its determinant is the product of its diagonal elements.
Duncan