The Distribution of Pairs of Points from a Spherical Shell

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We study, via characteristic functions, the distribution of the distance of pairs of points chosen uniformly and independently from a thin spherical shell. The main motivation is that we are interested in the distribution of the expected volume of spindles in *d*-dimensional models of random ball-polytopes. We determine the density in terms of integrals of Bessel functions using a method of Lord.

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- LORD, R. D., The distribution of distance in a hypersphere, Ann. Math. Statistics 25 (1954), 794–798.
- [2] LORD, R. D., The use of the Hankel transform in statistics. I. General theory and examples, *Biometrika* 41 (1954), 44–55.
- [3] WATSON, G. N., A treatise on the theory of Bessel functions, Cambridge Mathematical Library, Cambridge University Press, Cambridge, 1995.