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The Gaussian measure on algebraic varieties. (English) Zbl 0924.58005

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The aim of the present note is to prove that the ring $\mathbb{R}[M]$ of all polynomials defined on a real algebraic variety $M \subset \mathbb{R}^n$ is dense in the Hilbert space $L^2(M, e^{-|x|^2} d\mu)$, where $d\mu$ denotes the volume form of M and $d\nu = e^{-|x|^2} d\mu$ is the Gaussian measure on M . For $M = \mathbb{R}^n$, the result is well-known since the Hermite polynomials constitute a complete orthonormal basis of $L^2(\mathbb{R}^n, e^{-|x|^2} d\mu)$.

MSC:

58C35 Integration on manifolds; measures on manifolds

14P99 Real algebraic and real-analytic geometry

28A75 Length, area, volume, other geometric measure theory

58A07 Real-analytic and Nash manifolds

Keywords:

ring of polynomials; real algebraic variety; Hilbert space; Gaussian measure

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