

[Aptekarev, A. I.](#); [Dehesa, J. S.](#); [Sánchez-Moreno, P.](#); [Tulyakov, D. N.](#)

Asymptotics of L_p -norms of Hermite polynomials and Rényi entropy of Rydberg oscillator states. (English) [Zbl 1318.94027](#)

Arvesú, Jorge (ed.) et al., Recent advances in orthogonal polynomials, special functions, and their applications. 11th international symposium, Universidad Carlos III de Madrid, Leganés, Spain, August 29 – September 2, 2011. Proceedings. Providence, RI: American Mathematical Society (AMS) (ISBN 978-0-8218-6896-6/pbk). Contemporary Mathematics 578, 19-29 (2012).

Summary: The asymptotics of the weighted L_p -norms of Hermite polynomials, which describes the Rényi entropy of order p of the associated quantum oscillator probability density, is determined for $n \rightarrow \infty$ and $p > 0$. Then, it is applied to the calculation of the Rényi entropy of the quantum-mechanical probability density of the highly-excited (Rydberg) states of the isotropic oscillator.

For the entire collection see [\[Zbl 1250.00015\]](#).

MSC:

[94A17](#) Measures of information, entropy

[11B37](#) Recurrences

[33C45](#) Orthogonal polynomials and functions of hypergeometric type (Jacobi, Laguerre, Hermite, Askey scheme, etc.)

[42C05](#) Orthogonal functions and polynomials, general theory of nontrigonometric harmonic analysis

Cited in **8** Documents

Keywords:

[Hermite polynomials](#); [Rényi entropy](#); [Rydberg oscillator states](#); [Hermite polynomials](#)

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