

# GENERALIZATION OF THE NUALART-PECCATI CRITERION

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We generalize the Nualart-Peccati criterion for sequences of multiple stochastic integrals (known as the "fourth moment theorem") to a large class of pairs of even moments. This settles a problem that was implicitly open since the appearance of the original article by Nualart & Peccati in 2005. Our strategy is based on a general algebraic procedure, allowing one to deduce inequalities for the moments of the eigenfunctions of a diffusive Markov generator  $\mathbf{L}$  satisfying some suitable assumptions. Our study reveals several new probabilistic implications of the fine analytical properties of Hermite polynomials.

**Keywords:** Nualart-Peccati criterion, Markov diffusive generators, moment inequalities,  $\Gamma$ -calculus, Hermite polynomials, spectral theory.

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