On the eigenfunctions of the complex Ornstein-Uhlenbeck operators and applications

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Abstract: In this talk, we show that the complex Hermite polynomials are the eigenfunctions of complex Ornstein-Uhlenbeck operators, and obtain a product formula of Hermite polynomials. Using this formula, we give the relation between real Wiener-Itô chaos and the complex Wiener-Itô chaos (or: multiple integrals). As an application, we prove the fourth moment theorem (or say: the Nualart-Peccati criterion) for the complex Wiener-Itô multiple integrals.

[1] Chen Y., Liu Y., On the eigenfunctions of the complex Ornstein-Uhlenbeck operators, *Kyoto J. Math.*, Vol. 54(3), 577-596, (2014).
[2] Chen Y., Liu Y., On the fourth moment theorem for the complex multiple Wiener-Itô integrals, *Preprint* (2014)