Malliavin Calculus and Stein's Method

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Abstract

This talk is about so called Fourth Moment Theorems, which state that, under certain circumstances, weak convergence towards a Gaussian distribution is controlled by convergence of the fourth moment of the approximating sequence. These surprising results were discovered by Nualart and Peccati in 2005 and in 2009 Nourdin and Peccati combined Stein's method and Malliavin calculus to obtain quantitative versions of such Fourth Moment Theorems.

The so called Stein-Malliavin approach has initiated a very active stream of research, leading to some remarkable new results involving central limit theorems for functionals of infinite-dimensional random fields.