

An application of Ultra-probability to the Asymptotic Renorming Theory

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In this talk, we discuss the asymptotic analogue of Pisier's classical renorming theorem from a new probabilistic framework, which will be treated in full generality during Baudier's talk. Pisier's theorem states the equivalence between martingale type and martingale cotype to uniform smoothness and uniform convexity respectively, up to norm equivalence. In the classical theory, the geometry is encoded in binary trees, while in the asymptotic setting, the countably branching trees become the central geometric object. However, as we will see during the talk, this new probabilistic approach leads us to consider so-called ultra-martingales, which allow us to draw new parallels to Pisier's renorming. Furthermore, we will explore connections of these notions to the geometry of countably branching diamond graphs and to diamond convexity, a metric invariant introduced by Eskenazis, Mendel, and Naor. This is joint work with Florent Baudier (Texas A&M University).

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