ON BESOV REGULARITY OF BROWNIAN MOTIONS IN INFINITE DIMENSIONS

Tuomas P. Hytönen
Mark C. Veraar

Abstract: We extend to the vector-valued situation some earlier work of Ciesielski and Roynette on the Besov regularity of the paths of the classical Brownian motion. We also consider a Brownian motion as a Besov space valued random variable. It turns out that a Brownian motion, in this interpretation, is a Gaussian random variable with some pathological properties. We prove estimates for the first moment of the Besov norm of a Brownian motion. To obtain such results we estimate expressions of the form $\mathbb{E}\sup_{n\geq 1}\|\xi_n\|$, where ξ_n are independent centered Gaussian random variables with values in a Banach space. Using isoperimetric inequalities we obtain two-sided inequalities in terms of the first moments and the weak variances of ξ_n.

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