



Vector-valued decoupling and the Burkholder-Davis-Gundy inequality

Sonja Cox, Mark Veraar

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Let X be a Banach space. We prove p -independence of the one-sided decoupling inequality for X -valued tangent martingales as introduced by Kwapien and Woyczynski. It is known that a Banach space X satisfies the two-sided decoupling inequality if and only if X is a UMD Banach space. The one-sided decoupling inequality is a weaker property, including e.g. the space L^1 . We provide information on the optimal constants for various spaces, and give an upper estimate of order p in general. In the second part of our paper we derive Burkholder-Davis-Gundy type estimates for p -th moments, p in $(0, \infty)$, of X -valued stochastic integrals, provided X is a UMD Banach space or a space in which the one-sided decoupling inequality holds.

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