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Title: Hardy spaces and convergence of vector-valued Vilenkin–Fourier series

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The atomic decomposition of a vector-valued martingale Hardy space is given. A classical inequality of Marcinkiewicz is generalized for UMD lattice valued (bounded) Vilenkin–Fourier series. It is proved that the Vilenkin–Fourier series of $f \in L_p(X)$ ($1 < p < \infty$) converges to f in $L_p(X)$ norm if and only if X is a UMD space. Moreover, a lacunary sequence of the UMD lattice valued Vilenkin–Fourier series of $f \in H_1(X)$ converges almost everywhere to f in X norm.

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