



Mathematics > Functional Analysis

Pointwise convergence of vector-valued Fourier series

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(Submitted on 1 May 2012)

We prove a vector-valued version of Carleson's theorem: Let $Y=[X,H]_t$ be a complex interpolation space between a UMD space X and a Hilbert space H . For $p \in (1, \infty)$ and $f \in L^p(T; Y)$, the partial sums of the Fourier series of f converge to f pointwise almost everywhere. Apparently, all known examples of UMD spaces are of this intermediate form $Y=[X,H]_t$. In particular, we answer affirmatively a question of Rubio de Francia on the pointwise convergence of Fourier series of Schatten class valued functions.

Comments: 26 pages

Subjects: **Functional Analysis (math.FA)**; Classical Analysis and ODEs (math.CA)

MSC classes: 42B20, 42B25

Cite as: **arXiv:1205.0261 [math.FA]**
(or **arXiv:1205.0261v1 [math.FA]** for this version)

Submission history

From: Tuomas Hytönen [[view email](#)]
[v1] Tue, 1 May 2012 20:55:40 GMT (24kb)

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