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A John-Nirenberg Type Inequality for $\mathbf{Q}(\mathbf{R}^n)$

The John–Nirenberg inequality characterizes functions in the space BMO in terms of the decay of the distribution function of their oscillations over a cube [JN, 1961]. In joint work with Galia Dafni, we prove a John–Nirenberg type inequality for functions in the space $Q_\alpha(\mathbf{R}^n)$, which is a modified version of the conjecture by Essén, Janson, Peng and Xiao [EJPX, 2000]. We construct a function, as a counterexample, to show the necessity for this modification.