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ON BILINEAR LITTLEWOOD-PALEY SQUARE FUNCTIONS

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Abstract

On the real line, let the Fourier transform of k_n be $\hat{k}_n(\xi) = \hat{k}(\xi - n)$ where $\hat{k}(\xi)$ is a smooth compactly supported function. Consider the bilinear operators $S_n(f,g)(x) = \int f(x+y)g(x-y)k_n(y)\,dy$. If $2 \le p, q \le \infty$, with $1/p + 1/q = 1/2$, I prove that

$$\sum_{n=-\infty}^{\infty} \|S_n(f,g)\|_2^2 \le C^2 \|f\|_p^2 \|g\|_q^2 .$$

The constant C depends only upon k.

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