Lee, Jin; **Ha, Young-Hwa**
Perturbation of wavelet frames and Riesz bases. I. (English) Zbl 1101.42308
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Summary: Suppose that $\psi \in L^2(\mathbb{R})$ generates a wavelet frame (resp. Riesz basis) with bounds A and B. If $\phi \in L^2(\mathbb{R})$ satisfies $|\widehat{\psi}(\xi) - \widehat{\phi}(\xi)| < \lambda \frac{|\xi|^\alpha}{(1+|\xi|)^\gamma}$ for some positive constants α, γ, λ such that $1 < 1+\alpha < \gamma$ and $\lambda^2 M < A$, then ϕ also generates a wavelet frame (resp. Riesz basis) with bounds $A\left(1 - \lambda\sqrt{M/A}\right)^2$ and $B\left(1 + \lambda\sqrt{M/B}\right)^2$, where M is a constant depending only on α, γ, the dilation step a, and the translation step b.

MSC:

42C40 Nontrigonometric harmonic analysis involving wavelets and other special systems
41A30 Approximation by other special function classes

Full Text: DOI