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M-Refinable Extensions of Real Valued Functions

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M-REFINABLE EXTENSIONS OF REAL VALUED FUNCTIONS

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A function is m -refinable if it can be written as a linear combination of its m -dilates and integer translates. The coefficients of this linear combination form a sequence called the *refinement sequence*. Let $f : [0, N) \rightarrow \mathbb{R}$ and pick a sequence of real numbers $\{c_i\}_{i=0}^N$ so that $c_0, c_N \neq 0$. Then a unique function $\tilde{f} : \mathbb{R} \rightarrow \mathbb{R}$ can be constructed so that $\tilde{f}|_{[0, N)} = f$ and \tilde{f} is refinable with refinement sequence $\{c_i\}_{i=0}^N$. The construction of \tilde{f} suggests a method for characterizing all compactly supported m -refinable functions.