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Shift invariant spaces $V(\Phi)$ of $L^2(\mathbf{R}^d)$ having a stable generator of length n $\Phi = \{\varphi_1, \dots, \varphi_n\}$ occur in many applications in sampling theory, wavelet theory and approximation theory.

Given a finite set of arbitrary functions $F = \{f_1, \dots, f_m\}$ in $L^2(\mathbf{R}^d)$, and a fixed $n \in \mathbf{N}$, it is possible that the set F does not belong to **any** space $V(\Phi)$ with a stable generator of length exactly n .

Therefore it is an important question if there exists an “optimal” space $V(\Phi)$ - in some sense relevant to the application - for the set F .

This is the problem that we will address in this talk. (Received September 29, 2002)