

Speaker: Ole Christensen (joint work with Yonina Eldar)

Title: Generalized shift-invariant frames and duals for subspaces.

Abstract: Let T_k denote translation by $k \in Z^d$. Given countable collections of functions $\{\phi_j\}_{j \in J}, \{\tilde{\phi}_j\}_{j \in J} \subset L^2(R^d)$ and assuming that $\{T_k \phi_j\}_{j \in J, k \in Z^d}, \{T_k \tilde{\phi}_j\}_{j \in J, k \in Z^d}$ are Bessel sequences, we are interested in expansions

$$f = \sum_{j \in J} \sum_{k \in Z^d} \langle f, T_k \tilde{\phi}_j \rangle T_k \phi_j, \quad \forall f \in \text{span} \{T_k \phi_j\}_{k \in Z^d, j \in J}.$$

Our main result gives an equivalent condition for this to hold in a more general setting than described here, where translation by $k \in Z^d$ is replaced by translation via the action of a matrix. As special cases of our result we find conditions for shift-invariant systems, Gabor systems, and wavelet systems to generate a subspace frame with a corresponding dual having the same structure.