983-42-592   **Amos Ron*** (`amos@cs.wisc.edu`), Department of CS, 1210 West Dayton, UW-Madison, Madison, WI 53706, and **Zuowei Shen** (`matzuows@math.nus.edu.sg`), , Singapore. *Generalized Shift-Invariant Systems.*

A shift-invariant (SI) system in $L_2(R^d)$ is a collection of some functions together with all their lattice translates, for some lattice L. A generalized shift-invariant (GSI) system is a countable union of SI systems, where we allow the lattice L to vary from one SI system to another. A wavelet system (associated with a general, not necessarily integer, dilation) is, thus, not SI but is always GSI.

We study two properties of GSI systems: the Bessel property and the frame property. The characterization is done via the norm and the inverse norm of certain finite order matrices. We also use those matrices in order to study two different oversampling techniques of GSI systems: uniform and oblique.

For the case of a tight frames, all the associated matrices are equal to the identity map, and the characterization is then reduced to scalar identities. This induced characterization of tight frames was obtained independently by Hernandez and Weiss (by other techniques).

A wealth of special cases are covered by this uniform framework. Those include SI systems, wavelet systems and many variations of the wavelet theme. (Received September 13, 2002)