983-46-1286 **R. Balan**, **P. Casazza**, **C. Heil** and **Z. Landau*** (`landau@msri.org`). *Densities of Frames.* Preliminary report.

The decomposition of signals as a linear combination of some fixed set of vectors V is at the heart of most techniques in signal processing. The most common choice of V is a basis for the space of signals; such a situation produces a unique decomposition for any signal. However, picking an overcomplete set of vectors for V can be advantageous: from the many ways to decompose a given signal, a choice can be made that is "efficient". Frames are choices for V that are overcomplete but that otherwise resemble bases.

Often one tries to use the general structure of the signals to guide the choice of vectors $\{f_i\}$ for the frame. This is the case in Weyl-Heisenberg and wavelet systems where one sets the f_i to be shifts in time and frequency of a single vector (Weyl-Heisenberg) or dilates and shifts in time of a single vector (wavelet). In the case of Weyl-Heisenberg systems, a beautiful density result gives a necessary condition for the system $\{e^{2ia_jt}f(t-b_j)\}_j$ to be a frame in terms of the density of the points (a_j, b_j) in the plane. In this talk we'll give a general notion of density for frames (not necessarily Weyl-Heisenberg) and relate frame density to frame span. This work extends and unifies most of the known density results about frames. (Received September 30, 2002)