1046-43-1532 **John J Benedetto** (jjb@math.umd.edu), Department of Mathematics, Mathematics Building, University of Maryland, College Park, MD 20742-4015, and **Emily J King*** (eking@math.umd.edu), Department of Mathematics, Mathematics Building, University of Maryland, College Park, MD 20742-4015. *Smooth functions associated with wavelet sets on $\mathbb{R}^d$, $d \geq 1$, and frame bound gaps.*

The theme is to smooth characteristic functions of Parseval frame wavelet sets by convolution in order to obtain implementable, computationally viable, smooth wavelet frames. We introduce the following: a new method to improve frame bound estimation; a shrinking technique to construct frames; and a nascent theory concerning frame bound gaps. The phenomenon of a *frame bound gap* occurs when certain sequences of functions, converging in L^2 to a Parseval frame wavelet, generate systems with frames bounds that are uniformly bounded away from 1. We prove that smoothing a Parseval frame wavelet set wavelet on the frequency domain by convolution with elements of an approximate identity produces a frame bound gap. Furthermore, the frame bound gap for such frame wavelets in $L^2(\mathbb{R}^d)$ increases and converges as d increases. (Received September 15, 2008)