1035-46-623 **George K Yang*** (georgiyang@gmail.com), Department of Physics and Mathematics, Tennessee State University, Nashville, TN 37209. *Applications of Schwartz functions to wavelet analysis and random fields.*

We construct a Schwartz function having particular properties, and use it to form an analyzing wavelet for the space of square integrable functions. This enables us to create a wavelet kernel based on the analyzing wavelet. We show the properties of the wavelet transforms associated with the new analyzing wavelet. Then we discuss the applications to the wavelet transforms of tempered distributions, and to the wavelet transforms of observed signals, associated with the new analyzing wavelet, respectively. We show that the average power of the random field, which is formed by the wavelet transform of a square integrable random process X(u), is uniformly bounded by the norm of the random process X. Furthermore, we prove that if an observed signal Y(u) is the mixture of a square integrable true signal f(u) and some square integrable random noise X(u), then the average power of the wavelet transform of Y is bounded uniformly by the sum of the squares of the L2 norm of f and the L2 norm of X. (Received September 12, 2007)