Meeting: 1004, Bowling Green, Kentucky, SS 5A, Special Session on Advances in the Study of Wavelets and Multiwavelets

1004-43-105 **Lawrence W. Baggett** (baggett@euclid.colorado.edu), Department of Mathematics, Campus Box 395, University of Colorado at Boulder, Boulder, CO 80309-0395, and **Veronika Furst*** (furst@euclid.colorado.edu), Department of Mathematics, Campus Box 395, University of Colorado at Boulder, Boulder, CO 80309-0395. *A characterization of semi-orthogonal multiwavelets.* Preliminary report.

The complete characterization of orthonormal wavelets consists of two equations, one known as the Calderón condition, together with a norm requirement. G. Gripenperg and X. Wang proved independently that ψ is a Parseval wavelet if and only if the two equations $\sum_{j\in\mathbb{Z}} |\widehat{\psi}(2^j\omega)|^2 = 1$ and $\sum_{j=0}^{\infty} \widehat{\psi}(2^j\omega)\overline{\widehat{\psi}(2^j(\omega+m))} = 0$, where $m \in 2\mathbb{Z}+1$, are satisfied for a.e. $\omega \in \mathbb{R}$. In particular, ψ is an orthonormal wavelet if and only if $\|\psi\|_2 = 1$. Their proofs were generalized to multiwavelets by Calogero and by Bownik.

We now present a new proof of the forward direction in the case of semi-orthogonal multiwavelets. Our argument exploits the structure of generalized multiresolution analyses. (Received January 19, 2005)