

1068-94-108

**Dale H. Mugler\*** ([dmugler@uakron.edu](mailto:dmugler@uakron.edu)), Dept. of Biomedical Engineering, The University of Akron, Akron, OH 44325-1803. *Signal Cross-Correlation by Discrete, Dilated Hermite Functions.*

The continuous Hermite functions are eigenfunctions of the Fourier transform. In previous work, S. Clary and the author described an orthonormal set of eigenvectors for a *centered* version of the Fourier matrix that shares many of the properties of the continuous Hermite functions, and we called these eigenvectors the discrete Hermite functions. These eigenvectors can be easily computed as eigenvectors of a related tridiagonal matrix. Additionally, a dilation parameter can be introduced into that sparse matrix, whose eigenvectors create discrete, dilated Hermite functions. This talk concerns the properties of cross-correlation of vectors from this set of eigenvectors and how they can be applied to determine cross-correlations involving ultrawideband (UWB) signals. (Received January 15, 2011)