1. MagdyTawfik Hanna, Nabila Philip Attalla Seif and Waleed Abd El Maguid Ahmed, "Hermite-Gaussian Like Eigenvectors of the DFT Matrix Generated by the Eigen analysis of an Almost Tridiagonal Matrix," Proceedings of the IEEE International Symposium on Circuits and Systems, Kobe, Japan, pp. 832-835, May 23-26, 2005.


**Abstract:**

The development of the discrete fractional Fourier transform (**DFRFT**) necessitates having orthonormal eigenvectors for the **DFT** matrix **F**. The objective of having the **DFRFT** approximate its continuous counterpart can be met if the eigenvectors of **F** approximate samples of the Hermite-Gaussian functions. Here orthonormal Hermite-Gaussian like eigenvectors for **F** are rigorously derived by a detailed analysis of an almost tridiagonal matrix **S** which commutes with F. By an appropriate similarity transformation, **S** is reduced to a 2 x 2 block diagonal form and the elements of the two exactly tridiagonal matrices forming the two diagonal blocks are explicitly derived in terms of the elements of matrix **S**.