1035-41-422 **Tao Qian**, **Rui Wang**, **Yuesheng Xu** and **Haizhang Zhang*** (hzhang12@syr.edu),
Department of Mathematics, 215 Carnegie Hall, Syracuse University, Syracuse, NY 13244.
Orthonormal Bases with Nonlinear Phase.

For the time-frequency analysis of nonlinear signals and the purpose of building a mathematical foundation for the empirical mode decomposition, the bank $\mathcal{M}$ of real square integrable functions that admit a well-behaved Hilbert transform is investigated. A particular class of functions with explicit expressions in $\mathcal{M}$ is obtained using recent developments on the Bedrosian identity. We also construct orthonormal bases with the basis functions coming from $\mathcal{M}$ for the Hilbert space of real square integrable functions. (Received September 06, 2007)