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**John J Benedetto\*** ([jjb@math.umd.edu](mailto:jjb@math.umd.edu)), Norbert Wiener Center, Department of Mathematics, University of Maryland, College Park, MD 20742. *Frames and applied harmonic analysis.*

Frames are a generalization of orthonormal bases. They have natural applicability when noise reduction, numerical stability, or robust signal decomposition are desired. Examples range from quantum detection, to erasure problems on the internet, to antenna design for wireless communications. We describe three frame techniques. First, we construct number theoretic constant amplitude zero autocorrelation (CAZAC) sequences with optimal radar ambiguity function behavior. Second, we develop an effective low bit A/D coding theory. Third, we design a classification algorithm to analyze hyper-spectral imagery by means of the notion of frame potential energy. (Received September 13, 2011)