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John J. Benedetto* (jjb@math.umd.edu), Norbert Wiener Center, Department of Mathematics, University of Maryland, College Park, MD 20742. *Waveform design and a general form of matched filtering*. Preliminary report.

We construct constant amplitude zero autocorrelation (CAZAC) waveforms, designed to detect Doppler frequency shifts. User friendly software is provided to generate CAZACs, and simulations are given to illustrate determination of unknown Doppler shifts. This problem for CAZACs is motivated by modern problems in communications and radar. The setting leads naturally to the theory of frames. With regard to radar, and using the theory of frames, a general form of matched filtering is implemented which is modelled after quantum detection error criteria. This latter work is in collaboration with Andrew Kebo. (Received September 15, 2005)