

1035-O1-1933

gregory Emmett coxson* (gcoxson@ieee.org), 962 Wayne Avenue, Suite 800, Silver Spring, MD 20910. *Binary Code Imbalance and DC Bias Rejection for a Simple Hard-Limited Radar Detection Chain.*

Binary ± 1 codes are a common choice for radar pulse compression. The imbalance of such a code is the difference between the number of 1 elements and the number of -1 elements, in other words, the sum of the code elements. The DC response of a linear pulse compressor employing such a code is proportional to the code imbalance. For matched filtering, one might suppose then that zero imbalance is best for DC bias rejection in a radar detector. However, pulse compression is often preceded and followed by nonlinear processes. We find closed-form expressions for the mean and variance of the output from a simple process chain with a rho-theta limiter preceding and a square-law detector following pulse compression, and with input consisting of Gaussian noise added to a DC bias. These expressions will show that the best DC bias rejection in this case is achieved when code imbalance is the square root of the code length. (Received September 20, 2007)