

“Suppression of noise floor and dominant reflector response in random noise radar”, pp. 67-72

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Abstract – Noise radar can be used in a great number of applications including SAR. The non-periodic waveform suppresses the range ambiguity and reduces the probability of intercept and interference. Due to the random waveform, a noise floor is limiting the possible side lobe suppression. In strong clutter scenes with dominant reflectors, the induced noise floor can be too high and further suppression is needed. In this paper, the ambiguity function of random noise waveforms is first analysed, and a second moment formulation is introduced to include the noise floor effect. The use of mismatched filtering to improve the sidelobe suppression is discussed. Finally, an iterative subtraction algorithm is analysed for noise floor cancellation in the presence of dominating reflectors. This method was successfully tested on random step frequency radar data and random noise sodar data.