

# **The Effect of Windowing on the Performance of the CA-CFAR and OS-CFAR Algorithms**

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**Abstract**—A major challenge in radar design is to not overflow the processor with false detections. This paper investigates the performance of Constant False Alarm Rate (CFAR) algorithms on maintaining a fixed false alarm rate when windowing is used to reduce the sidelobes in both the slant-range and the Doppler domain. A Monte Carlo simulation was used to investigate the performance of Cell Averaging CFAR (CA-CFAR) and Ordered Statistic CFAR (OS-CFAR) algorithms. Results show that the windowing operation induces correlation between the samples. This correlation causes a large error in the Probability of False Alarm (PFA) when the CFAR scale factor was calculated using closed form equations, which assume that the samples are uncorrelated. In order to maintain a fixed false alarm rate when the windowing operation is used, the scale factor value should be calculated by simulation