

## An Adaptive CFAR Algorithm Based on Automatic Censoring in Heterogeneous Environments

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**Abstract :** In this work, we aim to improve the detection performances of radar systems. To this end, we propose and analyze a novel censoring technique of undesirable samples, of priori unknown positions, that may be present in the environment under investigation. Therefore, we consider heterogeneous backgrounds characterized by the presence of some irregularities such that clutter edge transitions and/or interfering targets. The proposed detector, termed automatic censoring constant false alarm (AC-CFAR), operates exclusively in a Gaussian background. It is built to allow the segmentation of the environment to regions and switch automatically to the appropriate detector; namely, the cell averaging CFAR (CA-CFAR), the censored mean level CFAR (CMLD-CFAR) or the order statistic CFAR (OS-CFAR). Monte Carlo simulations show that the AC-CFAR detector performs like the CA-CFAR in a homogeneous background. Moreover, the proposed processor exhibits considerable robustness in a heterogeneous background.

**Keywords :** CFAR, automatic censoring, heterogeneous environments, radar systems

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