

## Analysis of Formation Methods of Range Profiles for an X-Band Coastal Surveillance Radar

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**Abstract :** The paper deals with the problem of the formation of range profiles (RPs) for an X-band coastal surveillance radar. Two popular methods, the difference operator method, and the window-based method, are reviewed and analyzed via two tests with different datasets. The test results show that although the original window-based method achieves a better performance than the difference operator method, it has three main drawbacks that are the use of 3 or 4 peaks of an RP for creating the windows, the extension of the window size using the power sum of three adjacent cells in the left and the right sides of the windows and the same threshold applied for all types of vessels to finish the formation process of RPs. These drawbacks lead to inaccurate RPs due to the low signal-to-clutter ratio. Therefore, some suggestions are proposed to improve the original window-based method.

**Keywords :** range profile, difference operator method, window-based method, automatic target recognition

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