

REVIEWER'S REPORT

Manuscript No.: IJAR-57315

Title: OVERVIEW OF THIRD GENERATION SPACEBORNE X-BAND SYNTHETIC APERTURE RADAR (SAR)

Recommendation:

Accept

Rating	Excel.	Good	Fair	Poor
Originality	Yes			
Techn. Quality		Yes		
Clarity	Yes			
Significance		Yes		

Reviewer Name: Dr. Ashish Yadav

Detailed Reviewer's Report

Reviewer's Comment for Publication.

Acceptance Comment are mentioned below suitable for the paper titled " OVERVIEW OF THIRD GENERATION SPACEBORNE X-BAND SYNTHETIC APERTURE RADAR (SAR) "

Reviewer Comments: Accept

Reviewer Comments –

1. Introduction

The manuscript presents a timely and relevant overview of third-generation spaceborne X-band Synthetic Aperture Radar (SAR) systems, emphasizing their critical role in modern Intelligence, Surveillance, and Reconnaissance (ISR) applications. The study effectively highlights the importance of SAR technology in enhancing situational awareness for military surveillance, border monitoring, and national security operations. The motivation of the paper is well articulated, particularly in relation to the need for improved imaging performance and extended operational capabilities in defense applications.

2. Literature Review

The paper demonstrates a sound understanding of SAR system evolution and its operational significance in defense and security domains. It appropriately references the growing importance of high-resolution spaceborne radar systems and their contribution to IMINT applications. The discussion of current limitations in wide-swath, high-resolution imaging provides a strong foundation for the study. However, inclusion of more specific comparative references to existing third-generation SAR missions would have further strengthened the academic depth of the review.

3. Solution Approach

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The proposed approach focuses on conceptual engineering advancements for next-generation X-band SAR instruments. The paper outlines key architectural considerations aimed at overcoming existing limitations, particularly the trade-off between spatial resolution and swath width. The solution approach is well structured around system-level improvements, emphasizing enhanced instrument design and signal processing capabilities. The conceptual modeling of advanced SAR configurations is relevant and aligned with current research directions in spaceborne radar technology.

4. Results and Discussion

The study presents qualitative performance improvements expected from the proposed SAR architecture, particularly in terms of enhanced image quality and extended operational capability. The discussion effectively explains how next-generation design features can improve resolution without compromising coverage area. The potential impact on IMINT applications is well articulated, highlighting improved intelligence collection and decision-making support. While the paper does not include experimental validation, the engineering perspective provides valuable insights into future system performance trends.

5. Conclusion

The paper successfully outlines the potential advancements in third-generation spaceborne X-band SAR systems and their significance for defense and surveillance applications. It concludes that next-generation architectural enhancements can significantly improve imaging performance and operational effectiveness in ISR missions. The study contributes useful conceptual insights for future SAR system development, particularly in overcoming existing technical limitations. Overall, the manuscript provides a meaningful contribution to the field of spaceborne radar engineering and defense intelligence systems.