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## REVIEWER'S REPORT

Manuscript No.: **IJAR-53065** Date: 31-07-2025

**Title: CEMENTED DOUBLET LENS AND DIFFRACTION PATTERNS OF THE MAXIMUN SPATIAL FREQUENCIES OF THE FOURIER TRANSFORM**

**Recommendation:**
**Accept as it is ....................................**
Accept after minor revision.................
Accept after major revision .................
Do not accept (*Reasons below*) .........

| Rating | Excel. | Good | Fair | Poor |
|---|---|---|---|---|
| Originality | | ✓ | | |
| Techn. Quality | | | ✓ | |
| Clarity | | | ✓ | |
| Significance | | ✓ | | |

Reviewer Name: Mir Tanveer

**Reviewer's Comment for Publication.**

**General Evaluation:**
The paper presents a well-defined study focused on the interaction between diffraction phenomena and optical systems involving cemented doublet lenses. It combines theoretical modeling with experimental validation to analyze the limitations imposed by finite lens apertures on the propagation of high spatial frequencies in Fourier optics. The work effectively integrates concepts from angular spectrum propagation and diffraction theory, demonstrating a solid understanding of advanced optical physics.

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**Content and Thematic Coherence:**
The research is grounded in a clear theoretical framework involving the angular spectrum method. It considers practical and theoretical constraints such as vignetting and cutoff of spatial frequencies due to finite aperture sizes. The integration of the cemented doublet lens into the analysis is a relevant choice given its widespread use in minimizing chromatic aberrations in precision optical systems. The text moves logically from a conceptual introduction through to the formulation of a diffraction model and concludes with experimental imaging of diffraction patterns, maintaining thematic consistency throughout.

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**Methodology:**
The methodology combines theoretical derivation and experimental demonstration, which strengthens the credibility of the research. The use of rectangular geometry apertures as diffractive objects is

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methodologically sound and appropriate for assessing maximum spatial frequency behavior. The photographic technique used to capture intensity distributions under controlled conditions aligns with traditional methods in optics research and is still valid for qualitative and quantitative evaluations of diffraction patterns.

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**Mathematical Modeling and Experimental Correlation:**
The mathematical model based on the convolution integral of maximum spatial frequencies is a strong point of the work. It addresses the impact of the lens's finite aperture on the transmitted diffraction field effectively. The correlation between theoretical expectations and the presented experimental images demonstrates the model's robustness and the reliability of the measurement setup.

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**Language and Clarity:**
The paper communicates complex optical phenomena with adequate clarity. The abstract is concise yet sufficiently detailed to convey the scope of the work. Both the Spanish and English versions maintain technical accuracy and terminological consistency. The introduction is well-grounded in prior literature and provides a good transition into the core research discussion.

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**Scientific Contribution and Relevance:**
The study makes a relevant contribution to the field of physical optics by exploring how lens system characteristics affect the transmission and fidelity of high spatial frequency content in diffracted fields. The consideration of cemented doublet lenses in this context is particularly valuable for applications in optical imaging, microscopy, and laser systems where precise wavefront control is essential.

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**Final Assessment:**
This work stands as a competent and scientifically sound investigation into the impact of finite lens apertures on diffraction-based Fourier optics. Its integration of theory and experiment, along with its focus on maximum spatial frequency behavior, offers valuable insights for optical engineering and applied physics.