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"Measurement of roughness based on Talbot effect in reflection from rough surfaces"

by

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This paper needs clarification both because English usage is poorly implemented and because the purpose of the paper is not explained well enough. I thus recommend that this paper not be published in Applied Optics in its present form. Some specific comments follow, but they are not exhaustive, that is, please revise the whole paper and not only the parts addressed below.

1. The Talbot effect appears to be an important part of this paper, but there is no explanation of its definition and the properties that are used here. I guess that most readers of Applied Optics are not familiar with the Talbot effect and they should not be expected to search the literature to understand the substance of this paper. In particular, Talbot distance, Talbot number, and Talbot image should be explained in this paper.

2. In the abstract we find the expression "is studied." The reader is not particularly interested in what is studied, the accomplishments are the items of interest. Also an expression such as "the light incident angle" is improved by using "the angle of incidence of the light."

3. I do not understand the paragraph starting with "In our previous report" on p. 2. "Greet numbers" should probably "grit numbers."

4. What is meant by "determination of the contrast" on p. 2.

5. What are "theoretical considerations in reflection"? What does the whole paragraph starting with "The theoretical considerations" mean?

6. What does "magnitude response of scattering to different spatial frequencies" mean?

7. In Eq. (1), g is a function of ξ and η, but I do not see the η-dependence on the right-hand side. Where is it found?

8. In Eqs. (2) and (3), what are x' and y'?

9. What is meant by "According to Eq. (5)"?

10. What is meant by "the property of Dirac's delta function" after Eq. (6)? I do not see a delta function in Eq. (6). Incidentally, the Dirac's delta function is not a function at all. It is a distribution or generalized function, and these mathematical entities are not mentioned in the paper.

11. At the top of p. 5, what is meant by "for N taking integers"? Where is N defined? Is it an

index?

12. The authors write after Eq. (11) that "The height correlation function is usually assumed as a Gaussian function... or a decreasing exponential function." What is it for the samples used in the experiments? Further down, I do not understand the sentence starting with "However."

13. The explanation of the "experimental procedures and results" in Sect. 3 is very sketchy and hard to understand. For instance, the sentence starting with "In Eq. (12)" is not useful. It says that "v_0 can be obtained," but is it obtained and, if so, how is it obtained? How is the surface roughness computed? Where do the "calculated roughnesses" come from? How does Eq. (14) define the refractive index, as mentioned at the end of Sect. 3 in the sentence "the refractive index can be defined by calculation of the contrast in reflection"?

14. How are the intensity distributions in Figs. 5 and 6 determined? Are there any scales? Can the axes be labeled?

15. I do not understand the conclusions. Please remember that a reader might only look at the Introduction and Conclusions in a paper to decide whether he or she is interested in reading it.