

Response to review 5- Manuscript 949204

We are thankful to the reviewer 5 for appreciating our manuscript and for the time and the attention paid to evaluate our work. We think that his/her suggestions have helped us to improve the overall quality of the manuscript.

A detailed response to the referee's criticism follows.

1. In the 'Materials and Methods' section, you need to enter a subsection on numerical tests, including a reference to 'Appendix A'

In the original version of the manuscript, as the main features of the numerical methodology have been already proposed in other papers, we decided to describe the numerical/theoretical formulation in Appendix A. However, we fully understand the referee's point of view and, as the numerical analysis is a fundamental part of our paper, we now dedicate a Subsection in the "Materials and Methods" Section to the finite volume technique employed in our study.

2. It is also necessary to refer to the relationship of microdimples and roughness in the friction system, based on e.g.

Jing - Hu Ji, Cai - Wei Guan and Yong - Hong Fu, Effect of Micro-Dimples on Hydrodynamic Lubrication of Textured Sinusoidal Roughness, Surfaces, Chin. J. Mech. Eng. (2018) 31:67, <https://doi.org/10.1186/s10033-018-0272-z>

To give a more complete picture of the role of microdimples, it is worth considering their influence on vibrations in the frictional system based on e.g.

U. Sudeep, N. Tandon, R. K. Pandey, Friction and vibration behaviors of lubricated laser textured point contacts under reciprocating rolling motion with highlights on the used laser parameters, Procedia Technology 14 (2014) 4 - 11, 2212-0173, 2nd International Conference on Innovations in Automation and Mechatronics Engineering, ICIAME 2014

Chen, C., Wang, X., Shen, Y., Li, Z. and Dong, J. (2019), "Experimental investigation for vibration reduction of surface-textured journal bearings", Industrial Lubrication and Tribology, Vol. 71 Well. 2, pp. 232-241. <https://doi.org/10.1108/ILT-05-2018-0173>.

We are thankful to the reviewer for bringing these very interesting references to our attention. Now, we cite them in the manuscript.

3. In the abstract, it is worth clearly formulating the text of the study.

We have revised the abstract to better clarify the scope of our work.

4. In the caption for Figure 1, the signs 1, 2, 3, 4 should be explained - regardless of their indication in the text.

We have revised the caption: now, Figure 1 caption contains a complete description of the experimental setup.

5 Explain the meaning of 'f' in formula (1). It is better to give, for example, some subscript to this notation, because of the similarity to that used in 'fs'.

Explain the meaning of ' θ ' in formulas (4), (5) - a schematic drawing explaining the position of the system in relation to the analyzed microdimples would be useful

In formulas (6), (8), (9) to explain the meaning of ' n ' - the text is also for laymen

We are thankful to the referees for enlightening these small yet crucial integrations to our formulas. Regarding the meaning of ' θ ', now, it is better explained that we refer to a polar reference system; however, as we refer explicitly to the optical microscope image in Figure 3a, we prefer to avoid an additional drawing in the formulation as this could result in a non-necessary extension of the manuscript.

6. In Figure 2, it would be a good idea to enter a reference length segment.

We appreciate the comment, and we modify Figure 2 accordingly.

7. Please, give the exact formula used for calculation of the geometric void ratio (VR), with a specific explanation of what is taken as the microdimples area and what is the entire surface area considered (is it a fragment of a spherical surface or its projection?).

We simply calculate the void ratio as the ratio between the area occupied by the dimples and the total area of spherical shell base. Now, this is explicitly stated in the manuscript.

8. Figures 5 and 6 - need clearer markings and numbers on the axes, especially on the 'z'.

We have improved the intelligibility of Figures 5 and 6 according to the reviewer's suggestion.

9. Figure 7 - Could do with adding an enlarged center section - attention to detail

We understand the referee's suggestion, but we reckon that, if an enlarged center section was inserted, the reader could be distracted from the global performance of the texture, that is, the main scope of the Figure. Thus, we prefer to leave Figure 7 as it is.

10. In charts 7, 8, 12, 13, 14 - remove the grid lines - they worsen the readability

We sympathize with the referee's point of view, but, as it is important to have a quantitative idea of the advantages, given by the textures, in terms of friction reduction, we prefer to keep the grid lines as a guide to read the friction coefficient values.

11. Fig. 12 and 14 - explain the designation of the arrows directly in the drawing or in the figure caption

In both the Figures, the texture is the same, but by changing the flow direction, we obtain the equivalent divergent or convergent flow referred into the labels in the drawing. Now, this is made more explicit in the figure captions.

12. In the 'Results and Discussion' section, either separate subsections on experimental and numerical research, or specify in the description of the figures whether they refer to numerical or experimental results - otherwise it causes a bit of confusion.

We thank the reviewer for the suggestion, and we report now, explicitly in the caption, if the results refer to the experimental outcomes or to the numerical results.

13. It is better to avoid phrases like 'To this extent, we have started our study with symmetric textures, including the Nautilus, the Sunflower, the Fishbone and two uniform meshes with different geometric void ratios' in the 'Conclusion' section.

We have carefully revised the “Conclusion” section.