Review of: "Tsallis Entropy applied to microfluidic channels analysis"

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Potential competing interests: No potential competing interests to declare.

Tsallis Entropy applied to microfluidic channels analysis

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This article investigated the thermodynamics of fluid flow in a microchannel, exploring the possibility of evaluating the presence of obstacles and their influence on the fluid. The author used Tsallis entropy, introduced in 1988 by C. Tsallis, for generalising the standard statistical mechanics, particularly as a generalisation of the standard Boltzmann-Gibbs entropy. The final goal of this article was to demonstrate that information theory can be used to illuminate physical observations, even in those cases where the equations describing the phenomenon under investigation are intractable, are affected by a budget of uncertainty that makes their solution not affordable or may not even be known. The author applied an information theory-based approach to microfluidic data.

In this study, the author provides analysed data to justify the conclusions of the work. Furthermore, the manuscript is well-written, and the scientific contributions are presented in a very comprehensive way. Therefore, I recommend it for publication in the journal. Below, I have included some comments that the author must consider for the final version of their manuscript.

1. Although Tsallis entropy or distribution is quite common in literature, the author may include the original reference, for example, for equation 1, C. Tsallis, J. Stat. Phys. 52, 479 1988.
2. Shannon entropy defines the entropy of a discrete random variable in the information theory. In contrast, equation (1) is defined for a continuous random variable, and it determines the so-called differential entropy in the limit q -> 1 from the information theory point of view. The author may comment on that.
3. The author should emphasise with one sentence in the introduction section the benefit of using Tsallis distribution in their study. Furthermore, the author should comment on the applicability of the Tsallis formalism in investigating information flow/exchange between two or more weakly coupled channels.
4. The author makes a change in the variable of distribution u -> u/u_{max}; it should be commented if that would change the

expression for probability density distribution f(u) and entropy.

5. In equation (7), x is not defined.
6. The author should indicate the units used for the length and velocity in all the figures.
7. After equation (11), a change in the font of `h' should be corrected.
8. In equation (14), the word 'con' should be corrected.