Review of: "Fidelity of quantum blobs"

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Potential competing interests: No potential competing interests to declare.

Before I begin, I would like to clarify that I am not an expert in reviewing quantum mechanical arguments. My expertise lies more in the classical realm. Nevertheless, I hope my comments can be constructive. I want to commend the author on their well-written article. The concepts are conveyed clearly, and I found it both enjoyable and educational.

In the paper titled "Quantum distinguishability and symplectic topology," the author explores the use of fidelity to differentiate quantum states, employing an approach rooted in "symplectic topology." The conjecture proposed by the author, based on Liouville's theorem, asserts that the distinguishability of a pair of quantum blobs, as measured by quantum fidelity, remains constant over time.

The section on Limited Distinguishability provides an accurate overview of classical and statistical mechanics. The author effectively argues why two classical states are either identical or completely distinct based on Liouville's theorem and Hamilton's equations of motion. While this is indeed true, I believe it would be beneficial for the author to acknowledge (or at least mention) that the constancy of Gibbs's entropy, implied by Liouville's theorem for any time evolution governed by the Liouville equation, is a topic that is still under investigation and challenged by some researchers. The author may find the following resolutions to this problem useful:

- Coarse-graining
- Diffusive Liouville's equation
- The principle of maximum caliber
- Revised definitions of entropy

I hope these propositions serve the author well and help extend their framework. If the author desires further references on these concepts, I would be more than happy to provide additional information.

Lastly, while reading the paper, I had a question regarding the definition of the blobs as spheres. I wonder what would happen if they were different geometric objects, such as ellipsoids. It would be appreciated if the author could provide some references or insights on this matter.