

# Review of: "Quantum Solution of Classical Turbulence. Decaying Energy Spectrum"

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**Potential competing interests:** No potential competing interests to declare.

Referee's report on the paper "Quantum Solution of Classical Turbulence. Decaying Energy Spectrum"

The given paper is concerned with a recent advancement that transforms the problem of decaying turbulence in the Navier-Stokes equations in  $3 + 1$  dimensions into a Number Theory challenge, i.e., how to find the statistical limit of the Euler ensemble. By computing the vorticity correlation function, the author obtained an analytic formula for the observable energy spectrum—a complete solution of decaying turbulence derived entirely from first principles without the need for approximations or fitted dimensionless parameters, which reveals the full spectrum of critical indicators in the velocity correlation function in coordinate space, determined by the poles of the Mellin transform. The paper is well-written and clearly organized. The problem considered here is interesting, and the result is new. Therefore, the referee recommends this paper for publication in "Qeios," except for the following revisions: 1. The proofs for the results seem to be not strict, such as the Riemann conjecture, which has not been solved, is still used as an assumption for the investigation; 2. The abstract seems too long, and the motivation and innovation are not clear; 3. In the abstract, "fermions" should be "Fermions."