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Referee report

The Nussbaum-Szkoła distributions are classical probability distributions related to a pair of quantum states, introduced in the paper [11], where it was shown that their classical Rényi divergences and relative entropy is the same as the quantum counterparts of the two states. The present authors prove an extension to f -divergences and also to the case of density operators on an infinite dimensional Hilbert space. The result is used to show a number of entropic inequalities that follow directly from their classical versions.

The paper is technically sound, nicely written and easily readable, but does not seem to contain enough material for publication. The extension of the Nussbaum-Szkoła results is quite straightforward, using the spectral resolution of the relative modular operator which was basically obtained in the paper [10]. The main idea of the paper, namely that one can relate the quantum f -divergences to the classical ones and then apply the classical results, is essentially present already in [11] and the present paper does not seem to use it for any interesting purpose. The resulting set of inequalities seems like some random selection, it is not clear why these inequalities would be interesting? What is their interpretation in quantum information theory? It would be different if the authors could show some nice application, but as it is at present, I cannot give a recommendation for publication.