

J. E. Brasil, J. Knorst and A. O. Lopes: Lyapunov exponents
for quantum channels: an entropic formula and generic
properties

Referee report

In this paper, the authors study some properties of processes associated with the channel

$$\phi_L(\rho) = \int_{M_k} L(v)\rho L(v)^\dagger d\mu(v),$$

where $M_k = M_k(\mathbb{C})$, $L : M_k \rightarrow M_k$ is a measurable map and μ is a measure on the Borel σ -algebra of M_k .

A large part consists of a rather confused selection of definitions and results of the paper [10], without any proper introduction, explanation or motivation. It seems that this part has been taken from another paper of the authors [12] (also quite messy) with a lot of things omitted, so a reader has no chance to understand anything without reading [10] first. There are a lot of confusing statements, repetitions and omissions. Also the level of English decreases readability of the paper.

The paper [10] considers the case when L is the identity mapping, but in fact this contains the present case by choosing the induced measure μ^L . It is not clearly explained what is the purpose of introducing this further parameter L . The sections 1-7 just repeat some results in [10] with a remark as "the same proof works in our setting", but clearly the setting is the same. The only exception seems to be Sec. 3, where a notion of entropy is introduced, again without any explanation or motivation or in fact, results.

The last two sections seem to include some contribution by the authors, but its significance is not clear. But frankly, I doubt that any reader will get this far.

In conclusion, my recommendation is to reject the paper.