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Dynamical maps on quantum Orlicz spaces

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We present a new rigorous approach based on Orlicz spaces for the description of the statistics of large regular statistical systems, both classical and quantum. We emphasize that the presented formalism is applicable to QFT!
The pair of Orlicz spaces we explicitly use are respectively built on the exponential function
(for the description of regular observables) and on an entropic type function (for the corresponding states). They form a dual pair (both for classical and quantum systems). This pair $\langle L^{\cosh -1}, L\log(L+1)\rangle$ has the advantage of being general enough to encompass regular observables, and specific enough for the latter Orlicz space to select states with a well-defined entropy function.
Quantum dynamical maps are defined and studied for quantum statistical physics based on Orlicz spaces. We show that even in the most general non-commutative contexts, completely positive Markov maps satisfying a natural Detailed Balance condition, canonically admit an action on a large class of quantum Orlicz spaces. This is achieved by the development of a new interpolation technique, specifically suited to the above context, for extending the action of such maps to the appropriate intermediate spaces of the pair $\langle L^{\infty}, L^{1}\rangle$.

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