Contribution Title:	ASYMPTOTIC HYPOTHESIS TESTING FOR CORRELATED QUANTUM STATES
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Asymptotic hypothesis testing in its simplest form is about discriminating two states of a lattice system, based on measurements on finite blocks that asymptotically cover the whole lattice. In general, it is not possible to discriminate the local states with certainty, and one's aim is to minimize the probability of error, subject to certain constraints. Hypothesis testing results show that, in various settings, the error probabilities vanish with an exponential speed, and the decay rates coincide with certain relative-entropy like quantities. Apart from giving computable closed expressions for the error exponents, the importance of these results lies in providing an operational interpretation for the given relative entropy-like quantities. Settings of main interest are that of Stein's lemma as well as the Chernoff and the Hoeffdings bounds. Here I give an overview on the general method to handle such problems on quantum lattice systems and show applications to state discrimination problems on quasifree fermionic and bosonic lattices, Gibbs states of spin chains and group symmetry-restricted discrimination problems. I also show an application of state discrimination results to derive a lower bound on the classical capacity for finitely many uses of a quantum channel. The talk is based on the works

[1] F. Hiai, M. Mosonyi, T. Ogawa: Error exponents in hypothesis testing for correlated states on a spin chain; J. Math. Phys. 49, 032112, (2008),

[2] M. Mosonyi, F. Hiai, T. Ogawa, M. Fannes: Asymptotic distinguishability measures for shift-invariant quasi-free states of fermionic lattice systems; J. Math. Phys. 49, 072104, (2008),

[3] M. Mosonyi:Hypothesis testing for Gaussian states on bosonic lattices; J. Math. Phys. 50, 032105 (2009),

[4] M. Mosonyi, N. Datta: Generalized relative entropies and the capacity of classical-quantum channels; arXiv:0810.3478,

[5] M. Hayashi, F. Hiai, M. Mosonyi: Hypothesis testing under group symmetry; in preparation