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Influence-free states on compound quantum systems HOWARD BARNUM, Los Alamos National Laboratory, CHRISTOPHER FUCHS, Bell Laboratories, Lucent Technologies, JOSEPH RENES, Institüt für Theoretische Physik, Universität Erlangen, ALEXANDER WILCE, Dept. of Mathematical Sciences, Susquehanna University — Probability states for bipartite local measurements and correlations between local measurements are considered, in general and when the local systems behave quantum-mechanically. We review the facts that in general allowing local measurements conditional on classically communicated results from the other site imposes no-signalling in the direction opposite communication, and that in the locally quantum case, two-way no-signalling restricts states to be in the dual of the cone of unentangled states, isomorphic to that of positive maps. We show that in the "decomposable" subcone, generated by quantum states and their partial transposes, the extremal quantum states and extremal partial transposes remain extremal. And we show that decomposable states do not violate Cirelson inequalities. We show that locally-quantum no-signalling states must be combined in a thoroughoing no-signalling fashion. Thus Alice and Bob cannot consistently accumulate a sequence of independent states of this nature (as they might a supply of shared Bell states to use in entanglement distillation) while having available the full panoply of quantum observables and operations at their respective sites. The relation of no-signalling to the "closest-to-Bayesian" conditional quantum dynamics of C. Fuchs will also be touched on.

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