

PHYSICAL MATHEMATICS SEMINAR

Quantum Speed Limits and the Maximal Rate of Information Production

SEBASTIAN DEFFNER

University of Maryland, Baltimore County

ABSTRACT:

The Bremermann-Bekenstein bound sets a fundamental upper limit on the rate with which information can be processed. However, the original treatment heavily relies on cosmological properties and plausibility arguments. In this talk, we derive equivalent statements by relying on only two fundamental results in quantum information theory and quantum dynamics: the Fannes inequality and the quantum speed limit. As main results, we obtain Bremermann-Bekenstein-type bounds for the rate of change of the von Neumann entropy in quantum systems undergoing open system dynamics and for the rate of change of the Shannon information encoded in some logical states undergoing unitary quantum evolution.

TUESDAY, NOVEMBER 17, 2020

2:30 PM – 3:30 PM

<http://math.mit.edu/seminars/pms/>

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