Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

Towards an Experimental Demonstration of Superadditivity through the Dephrasure Channel[1] SPENCER JOHNSON, NICHOLAS LARACUENTE, MARIUS JUNGE , ERIC CHITAMBAR, PAUL KWIAT, University of Illinois at Urbana-Champaign — One of the key difficulties in computing channel capacities for quantum communication channels is the superadditivity of coherent information. In stark contrast to classical communication, quantum channels can in principle exhibit "superadditivity": the coherent information capacity of multiple uses can exceed - albeit only slightly - the sum of the individual channel's capacities. Superadditivity of coherent information has been established theoretically in the case of the dephrasure channel, which combines erasure and dephasing. The dephrasure channel exhibits superadditivity for as few as two channel uses; this, combined with the channel's simple form, makes it a good candidate for experimental investigation. We report on ongoing progress to construct the dephrasure channel as a testbed for nonadditivity in quantum channels.

[1]Funding for this work has been provided by NSF Grant No. RAISE-TAQS 1839177

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Date submitted: 01 Feb 2019 Electronic form version 1.4