Abstract Submitted for the DAMOP12 Meeting of The American Physical Society

Experimental demonstration of quantum gain in a zero-sum game CHONG ZU, YUEXUAN WANG, XIUYING CHANG, Center for Quantum Information, IIIS, Tsinghua University, Beijing, China, ZHAOHUI WEI, Centre for Quantum Technologies, National University of Singapore, Singapore, SHENGYU ZHANG, Department of Computer Sci. and En., The Chinese University of Hong Kong, Hong Kong, LUMING DUAN, Department of Physics and MCTP, University of Michigan, Ann Arbor, Michigan, USA — We propose and experimentally demonstrate a zero-sum game which is in a fair Nash equilibrium for classical players, but a quantum player can always win using an appropriate strategy. The gain of the quantum player is measured experimentally under different quantum strategies and input states. It is found that the quantum gain is maximized under a maximally entangled state, but does not reduce to zero when entanglement disappears. Instead, it links with another kind of quantum correlation described by discord for the qubit case.

Chong Zu Center for Quantum Information, IIIS, Tsinghua University

Date submitted: 27 Jan 2012 Electronic form version 1.4