Abstract Submitted
for the 4CF17 Meeting of
The American Physical Society

Measuring Quantum Uncertainties using IBM's 5-qubit Quantum Computer AJ RASMUSSON, JEAN-FRANCOIS VAN HUELE, Brigham Young University — From the original Heisenberg uncertainty relation to modern error-disturbance relations, quantum uncertainty relations describe the limitations of joint quantum measurements. Currently, the relations' range of validity is under experimental test. In May, 2016, IBM launched the IBM Q Experience—a free, programmable web interface directly connected to a 5-qubit quantum computer. I verify specific spin uncertainty relations using the quantum nature of the device. Overall, the 5-qubit device can show no violation of Heisenberg uncertainty and error-disturbance relations. However, violation can occur due to various sources of error and a low number of samples per experiment.

Jean-Francois Van Huele
Brigham Young University

Date submitted: 18 Sep 2017 Electronic form version 1.4