Signatures of quantum effects in weak measurements of qubits
RUSKO RUSKOV, Penn State University, ALEXANDER N. KOROTKOV, University of California, Riverside, ARI MIZEL, Penn State University — In many proposed qubit designs, especially solid state qubit systems, it is experimentally difficult to perform ideal projective von Neumann measurements, and one must resort to weak measurements. In this work, we describe signatures of quantum coherence and entanglement in the output of weak measurements. Both one and two qubit cases are addressed. We consider the ability of a measuring device to generate, as well as detect, entanglement. The interpretation of the power spectrum of weak measurements is discussed, especially its “quantum” and “classical” parts.