**Tek + Alazar v.s. QICK**

**Introduction**

High speed readout and control system are essential to qubit operations. Traditionally, time domain qubit measurement and control involve many separate components. The basic instrument needed are arbitrary waveform generator (AWG), RF source, IQ mixer, and digitizer. Such time-domain systems are not only space consuming, but also complex in wirings and software control. Worst of all, the high cost of instrument sets result in difficulty of scaling up for multi qubit systems. Here we adapt the qubit instrumentation and control kit (QICK) [1] based on Xilinx Field-programmable gate array (FPGA) RFSoC evaluation board and perform several qubit experiments such as 1Q qubit characterization (Rabi, T1, T2, etc.), 1Q randomized benchmarking, 5Q experiment. We achieved similar measurement results, but using only the two instrument QICK and RF source. The AWG and digitizer are completely replaced by QICK. Furthermore, as the time resolution of FPGA product keep improving, the RF source may not even be needed – a single QICK alone can perform all the tasks in the future. Such space and cost efficient RFSoC boards are ideal building blocks for developing quantum computers.