

Status of SCA Testing

Hulin Wang

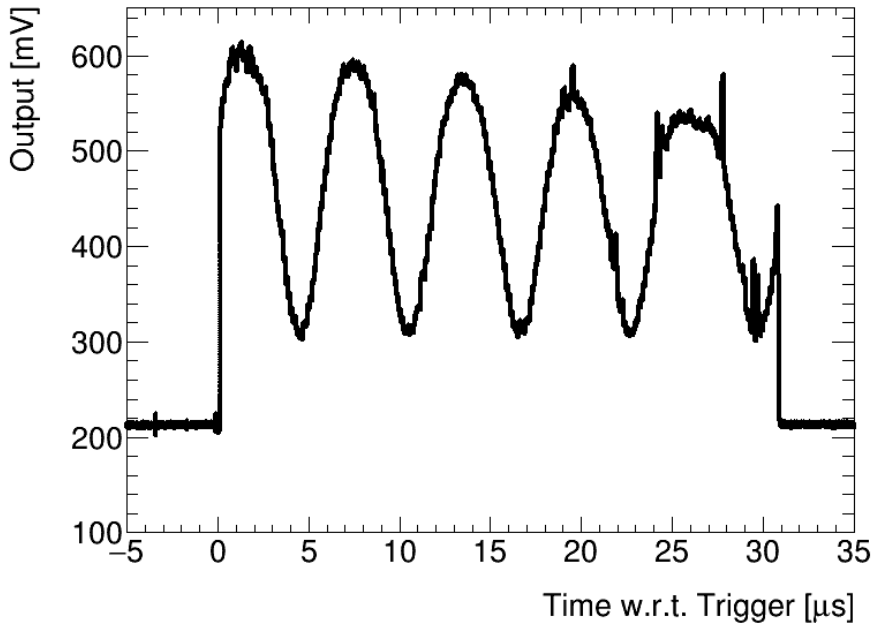
CCNU

July 15, 2020

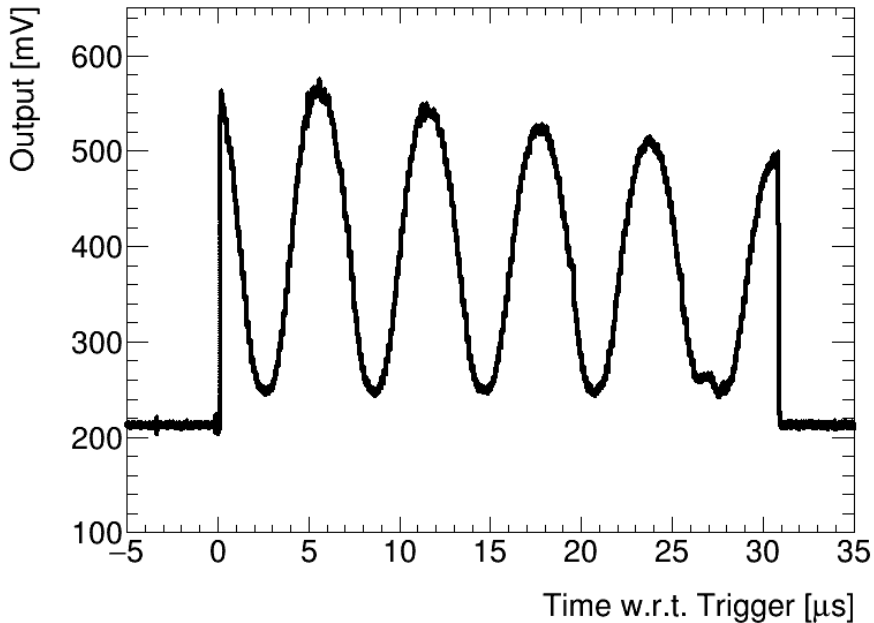
- Jun Liu helped to set up the testing system.
 - Need to manually press the "trigger and configure" button every time a data-taking is made. Any idea how to improve it?
- Data taken with Oscilloscope:
- Rigol (input signal) setting: output impedance $50\ \Omega$
- Oscilloscope setting:
 - input impedance: $50\ \Omega$
 - sampling rate: 20 G/s, 1M point per frame
- SCA Chip setting:
 - haven't changed the firmware so far
 - use channel 1; channel 2 yields similar output; channel 3,4 is problematic
- Input signals:
 - *sin* input: 500 mV_{pp}, 200-900 mVDC, 19.531 MHz (5 periods assuming 1G sampling rate)
 - *sin* input: (200,700) mV_{pp}, 700 mVDC, 19.531 MHz
 - *square* input: 500 mV_{pp}, (300,700) mVDC, 19.531 MHz
 - DC 300-900 mV

- Looks like the first order response function is not $f(x) = ax + b$, but $f(x) = a(x)x+b$
- How to match the output with the exact input? (can use DC input for now)
- Output drops with time (or cell number?), due to the storing time or loss in readout line?
- $\sim 214mV$ base output without input
- The readout time for 256 cells is $\sim 31 \mu s$, is it expected?
- Any correction due to the Rigol and Oscilloscope impedance setting?

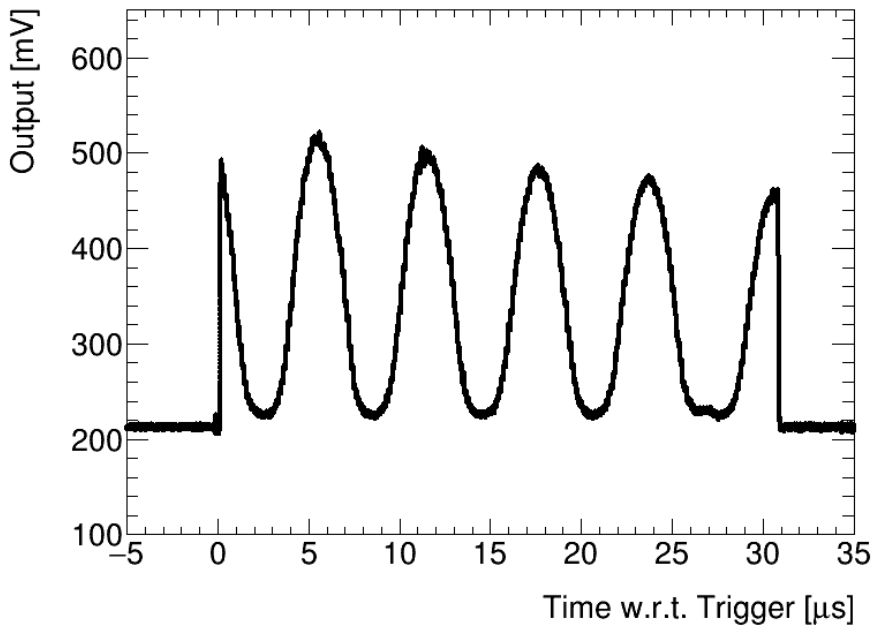
sin : 500mV_{pp} 900mVDC 19.531MHz



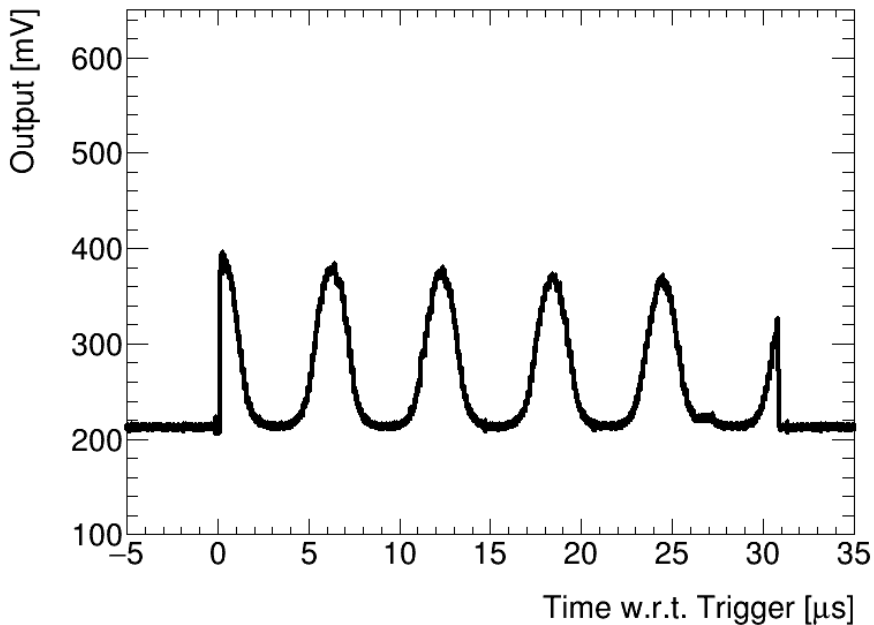
sin : 500mV_{pp} 800mvDC 19.531MHz



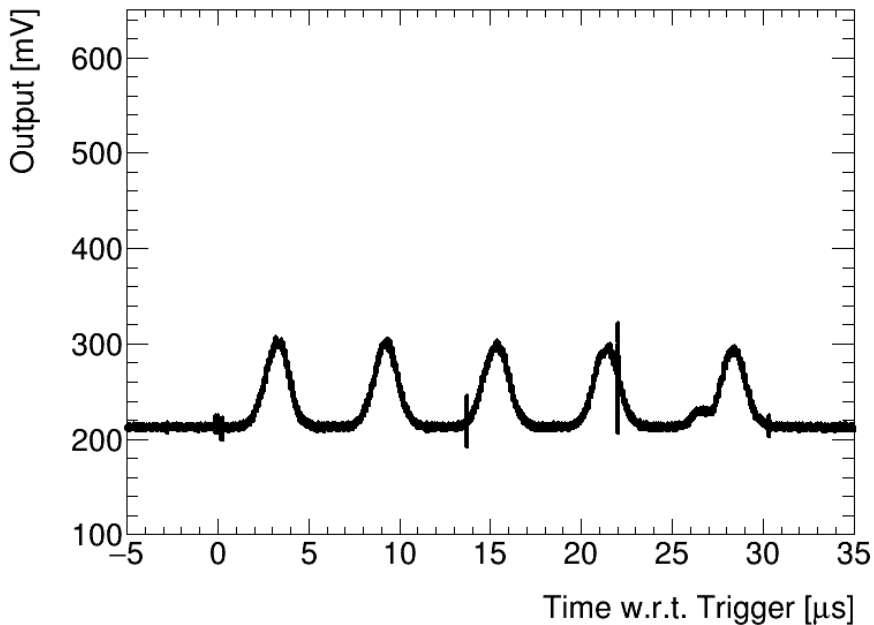
sin : 500mV_{pp} 700mVDC 19.531MHz



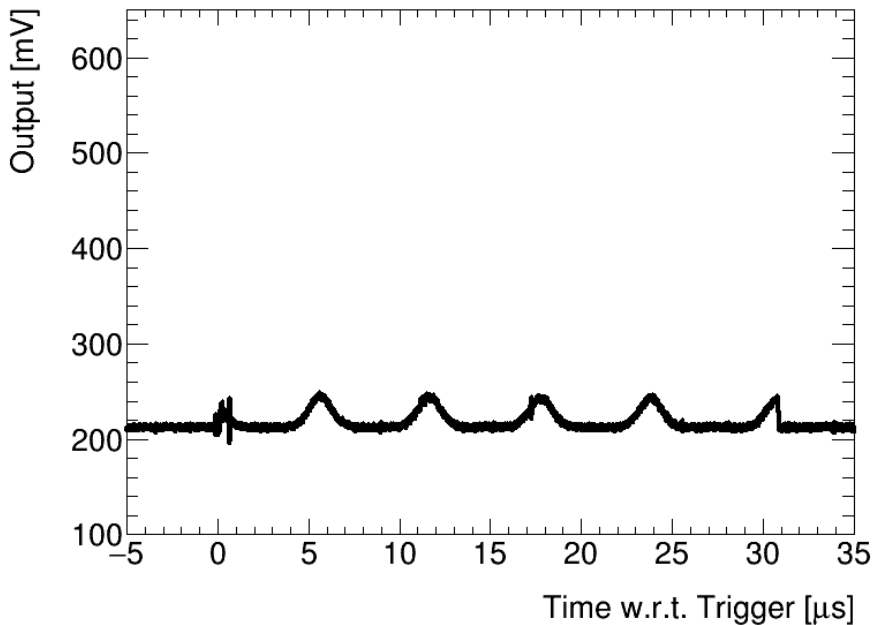
sin : 500mV_{pp} 500mVDC 19.531MHz



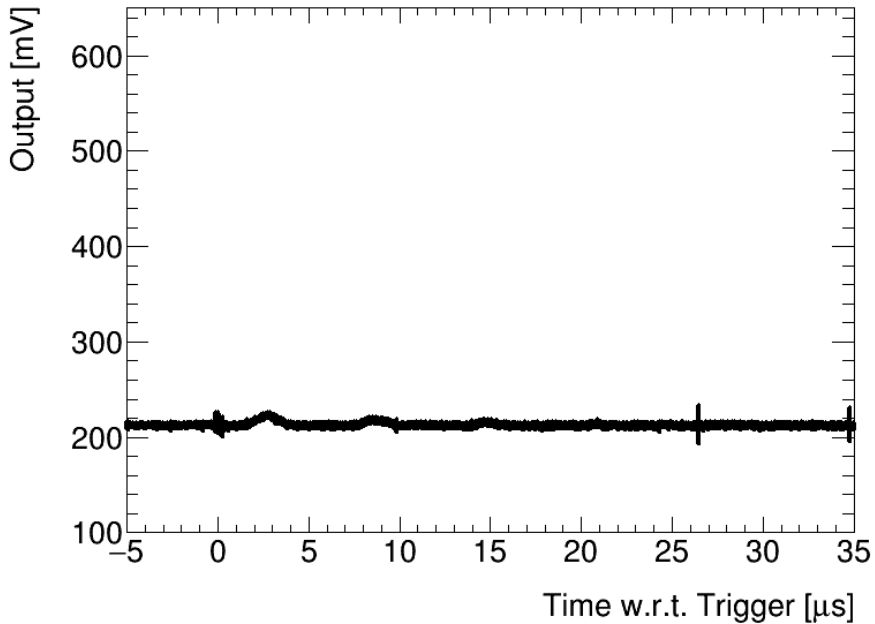
sin : 500mV_{pp} 400mV_{DC} 19.531MHz



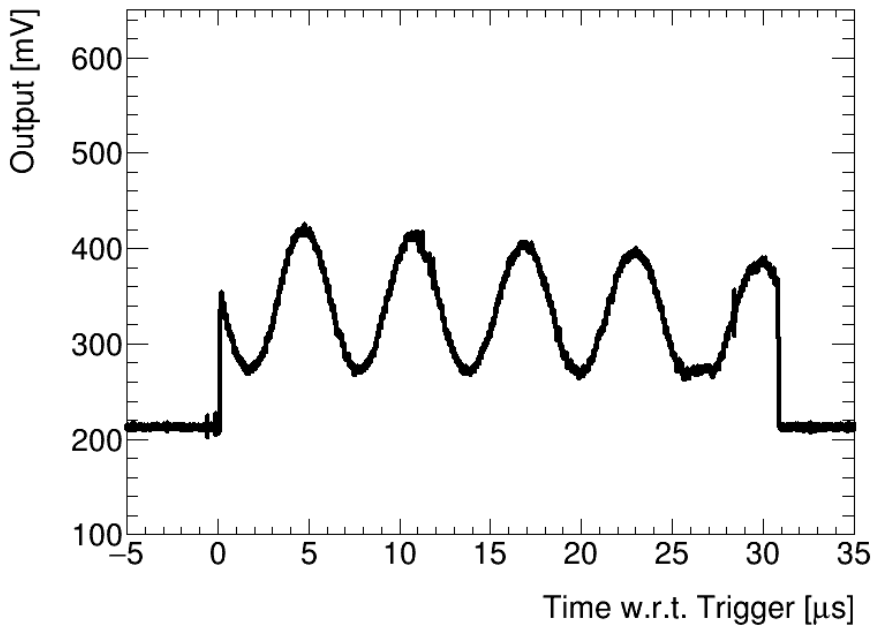
sin : 500mV_{pp} 300mV_{DC} 19.531MHz



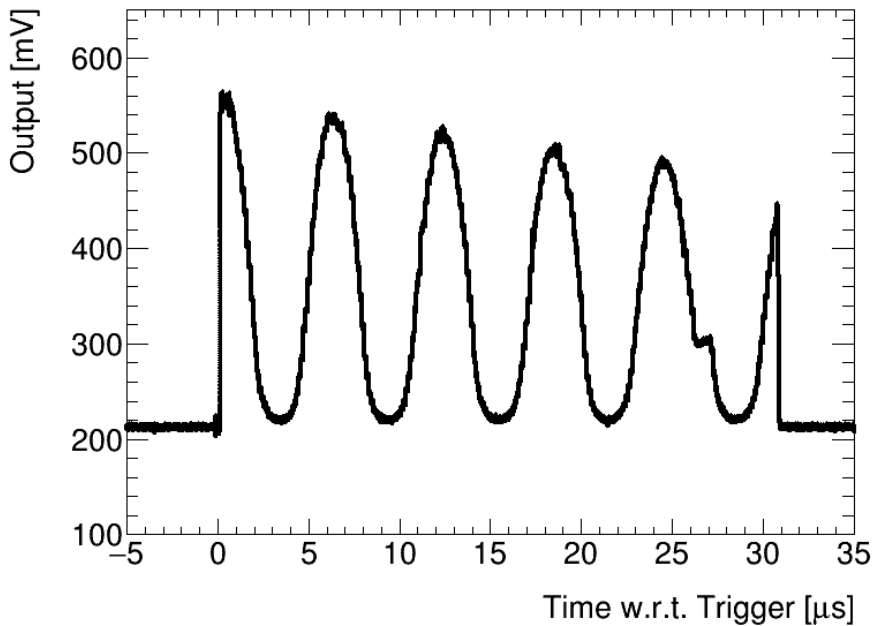
sin : 500mV_{pp} 200mVDC 19.531MHz



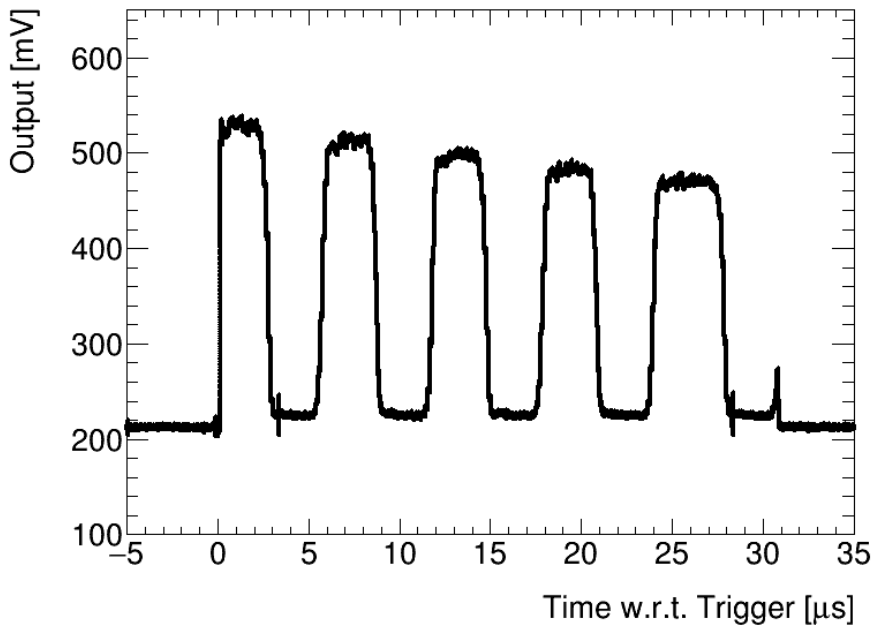
sin : 200mV_{pp} 700mVDC 19.531MHz



sin : 600mV_{pp} 700mVDC 19.531MHz



square : 500mVpp 700mvDC 19.531MHz



square : 500mVpp 300mVDC 19.531MHz

