Atomic Frequency Standards

Notes on Experiment

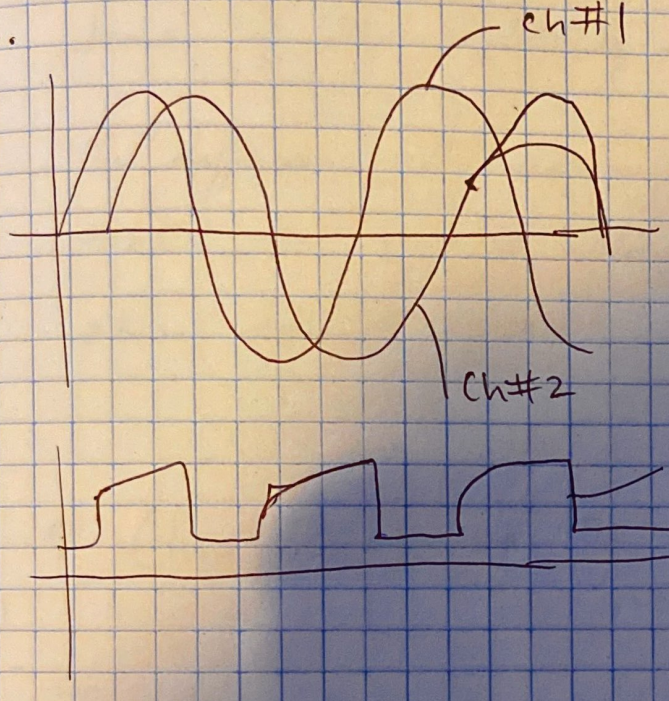
CH#1 – Model FS725

CH#2 – Model PRS10

Ch#3 – Model DG535

1

A.



We see that even though the oscilloscope is triggering on ch#1, ch#2 is still visible meaning they share almost the same frequency.

B. The data was saved to T0001.CSV

C.

Ch#1	Frequency	10.00 ± 0.08 MHz
Ch#2	Frequency	10.00 ± 0.08 MHz
Ch#3	Frequency	10.00 ± 0.03 MHz

Ch#1 + Ch#2 should not fluctuate. This might have something to do with the Oscilloscope's ability to measure the frequencies

AS

D. After looking at the phase difference, we determined it would take ≈ 1800s for a full 360° phase difference to happen.

The frequencies of the two clocks are roughly the same if the uncertainty is accounted for.

The difference in frequency seems to be inversely related to the the time it takes for a 360° phase difference.

2

~~A~~ Channel #2 on the 53220A had a longer cable than the one for CH#1

~~B~~)

A. The file will be named to Datalog01

B. We set the start delay to 20s

We set the run time to 3:28 min

Keysight 53220A

CH#1 — PRS10

CH#2 — Model Db535

3

B. ~~The~~

Ch#2 — 10.000 000 5 ± 0.000 000 5 MHz

CH#1 — 9.999 996 883 ± 0.000 000 003 MHz

C. With external reference plugged in.

CH#1 — 9.999 999 998 ± 0.000 000 001 MHz

CH#2 — 10.000 001 6 ± 0.000 001 MHz

The Uncertainties seem to have improved!

Ext in = Model FS725

File was saved to Data log 5 — Db535

File was saved to Data log 6 — PRS10