Bubble flow rate measurement

Sayan, 18th July, 2023

- Data from 512 sessions

- Each session 15 min long

- 60,000 data points collected for each bubbler on each session

	Pi rate (Hz)	Eyeball rate (Hz)
Bubbler 7	0.80 ± 0.40	1.40
Bubbler 8	0.21 ± 0.27	1.03

Bubble flow rate measurement

Sayan, 18th July, 2023

- Data from 512 sessions

- Each session 15 min long

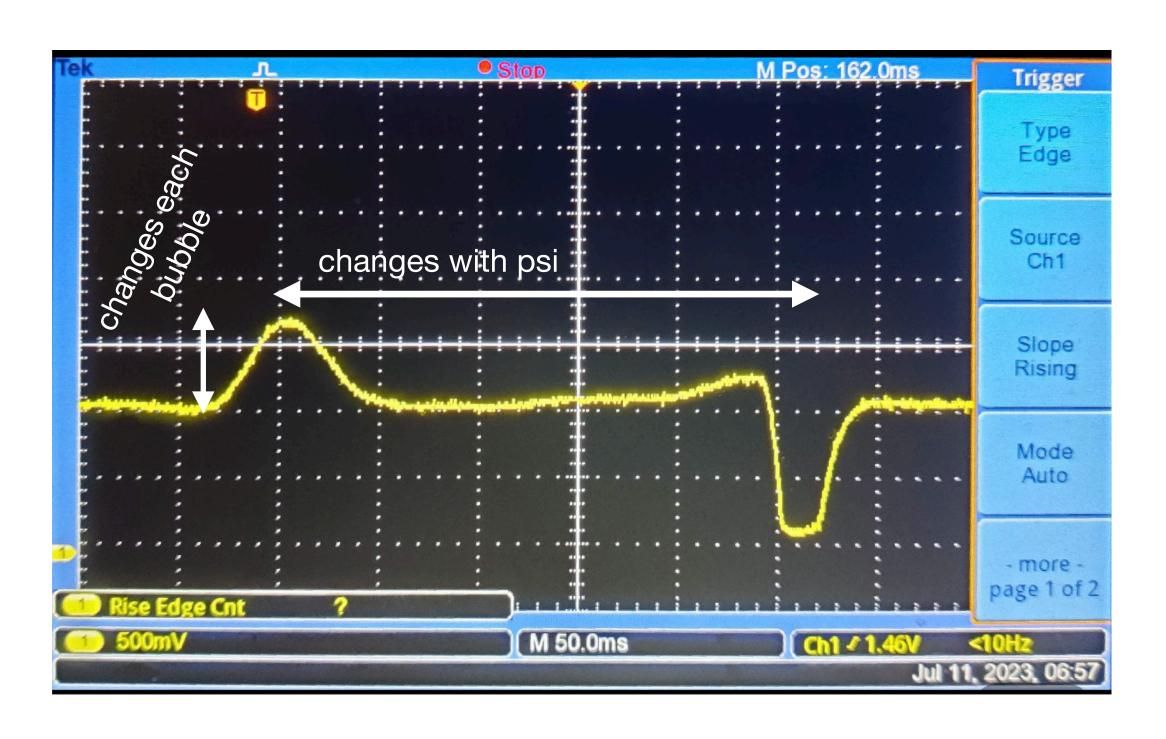- 60,000 data points collected for each bubbler on each session

- Bubble shape changes

  - Height changes for every bubble

    - Sometimes too low for theshold value

  - Width changes with psi

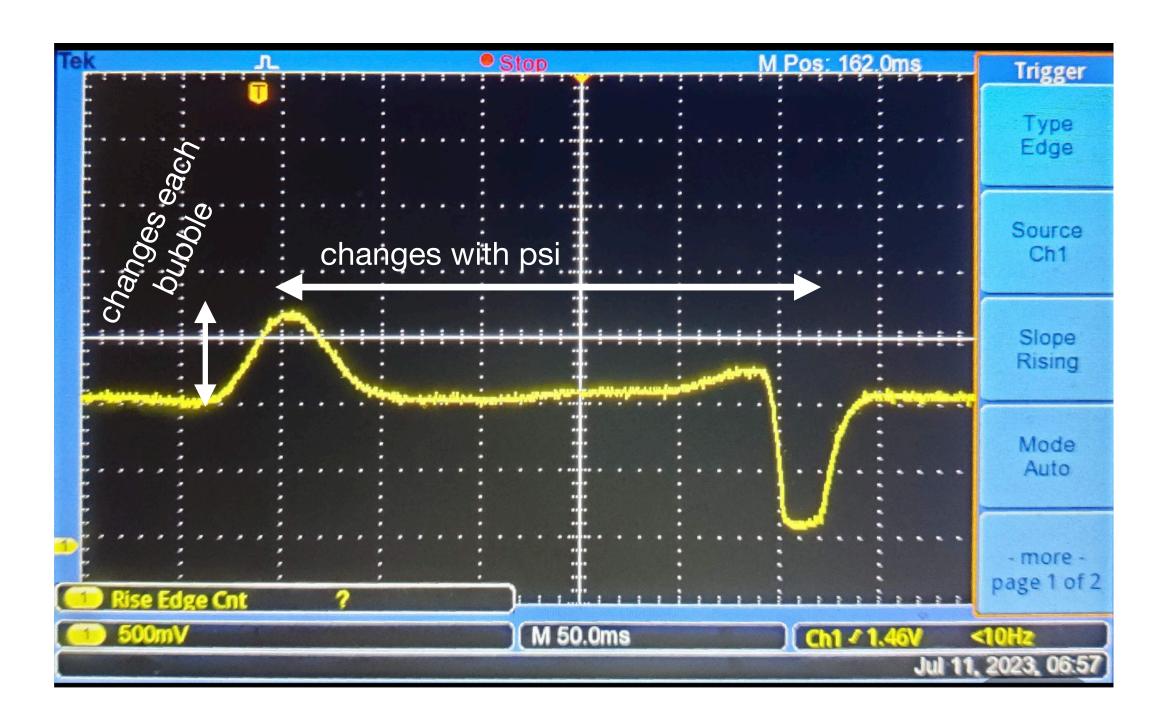|	Pi rate (Hz)	Eyeball rate (Hz)
Bubbler 7	0.80 ± 0.40	1.40
Bubbler 8	0.21 ± 0.27	1.03

flow rate data collected at ISU bubbler pannel

UNIX timestamp	Spi0/ Bubbler 7 (Hz)	Spi4/ Bubbler 8 (Hz)	Session time interval (min)	Session date (UTC)	Session time (UTC)
1,689,563,596.1	0.901	0.000	14.93	7/17/23	3:13 AM
1,689,564,490.5	0.945	0.000	14.92	7/17/23	3:28 AM
1,689,565,384.6	0.945	0.000	14.90	7/17/23	3:43 AM
1,689,566,279.6	0.961	0.000	14.92	7/17/23	3:57 AM
1,689,567,175.0	0.946	0.000	14.92	7/17/23	4:12 AM
1,689,568,069.6	0.925	0.000	14.91	7/17/23	4:27 AM
1,689,568,964.5	0.786	0.000	14.91	7/17/23	4:42 AM
1,689,569,860.1	0.764	0.000	14.93	7/17/23	4:57 AM
1,689,570,754.4	0.793	0.000	14.91	7/17/23	5:12 AM
1,689,571,650.2	0.775	0.000	14.93	7/17/23	5:27 AM
1,689,572,544.6	0.802	0.000	14.91	7/17/23	5:42 AM
1,689,573,439.3	0.900	0.000	14.91	7/17/23	5:57 AM
1,689,574,335.0	0.789	0.000	14.93	7/17/23	6:12 AM
1,689,575,229.1	0.750	0.000	14.90	7/17/23	6:27 AM
1,689,576,123.1	0.767	0.000	14.90	7/17/23	6:42 AM
1,689,577,018.0	0.807	0.000	14.92	7/17/23	6:56 AM
1,689,577,911.3	0.948	0.367	14.89	7/17/23	7:11 AM
1,689,578,806.4	0.891	0.558	14.92	7/17/23	7:26 AM
1,689,579,700.9	0.952	0.594	14.91	7/17/23	7:41 AM
1,689,580,595.7	0.991	0.535	14.91	7/17/23	7:56 AM
1,689,581,493.2	0.975	0.583	14.96	7/17/23	8:11 AM

	Pi rate (Hz)	Eyeball rate (Hz)
Bubbler 7	0.80 ± 0.40	1.40
Bubbler 8	0.21 ± 0.27	1.03

- To-do

  - Feat: count multiple signals as one, work with Noah and generate PVs

  - Refactor: integrate mux and spi codes

  - Chore: test multiple channels

    - Setting up breadboard

7/12/23 11:17 AM

- Ran the bubbler with integration time 10min taking data every 1 ms
  - 600k data taken every 10min
- Took 155 readings
- Bubbler 7 -> spi0, bubbler 8 -> spi4

Bubbler 7: eyeballing: 1.40 Hz, Pi: 0.95 ± 0.63 Hz

Bubbler 8: eyeballing: 1.03 Hz, Pi: 0.31 ± 0.27 Hz