

# KLM Bubbler updates

## KEK updates

Michele, Noah, Sayan, 8th November, 2023

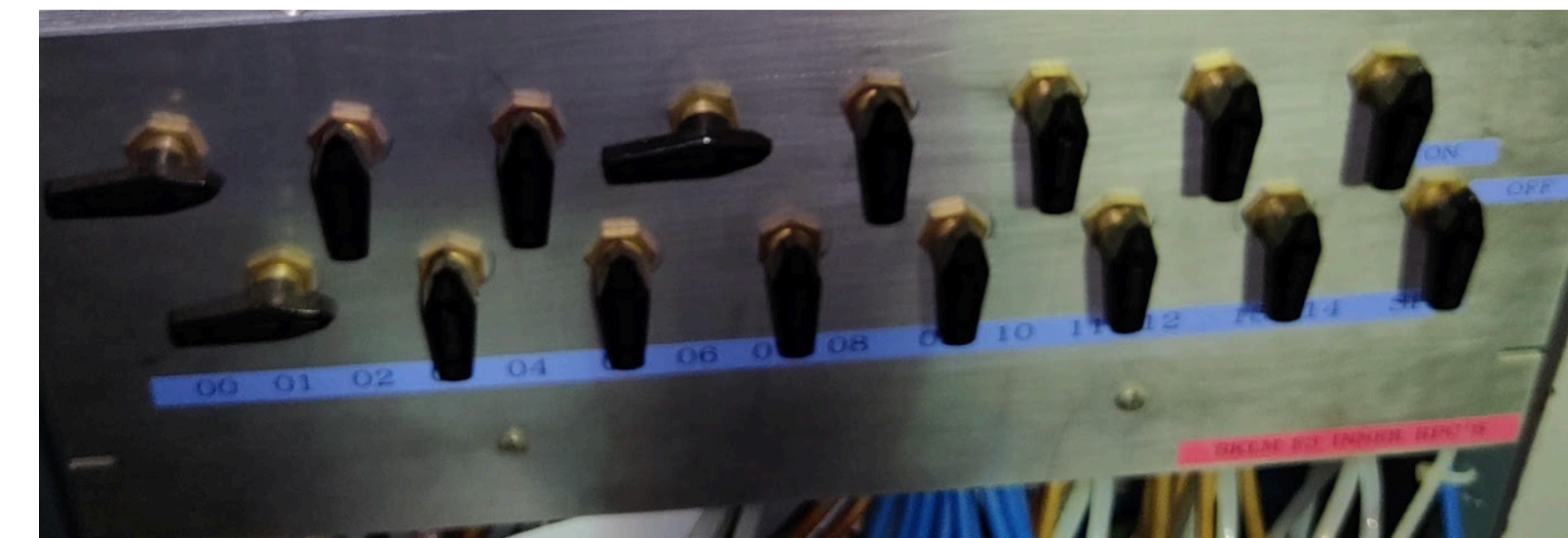
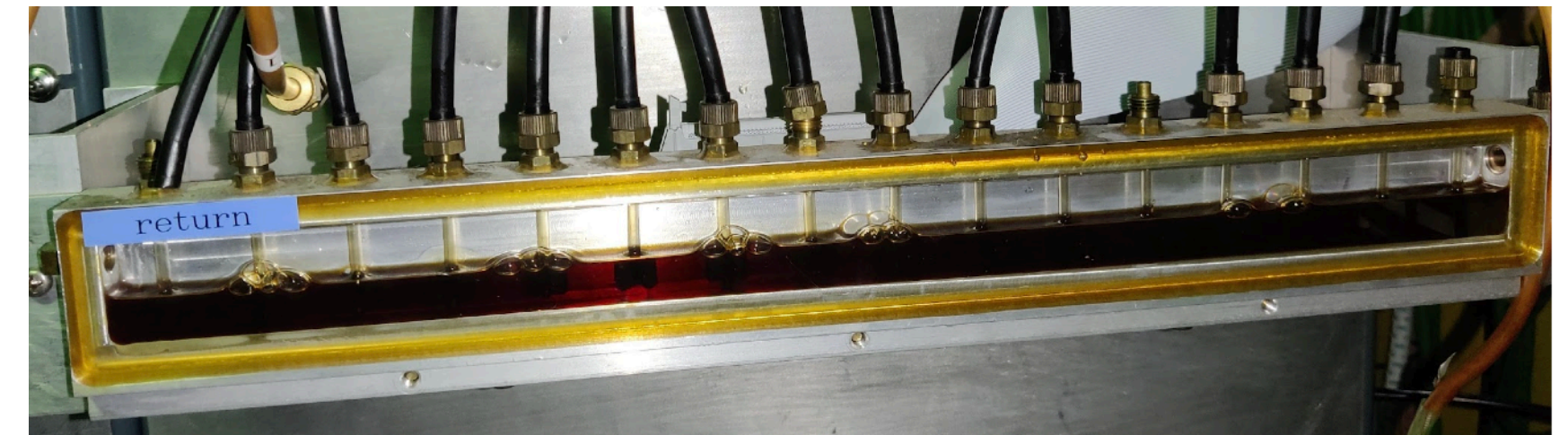
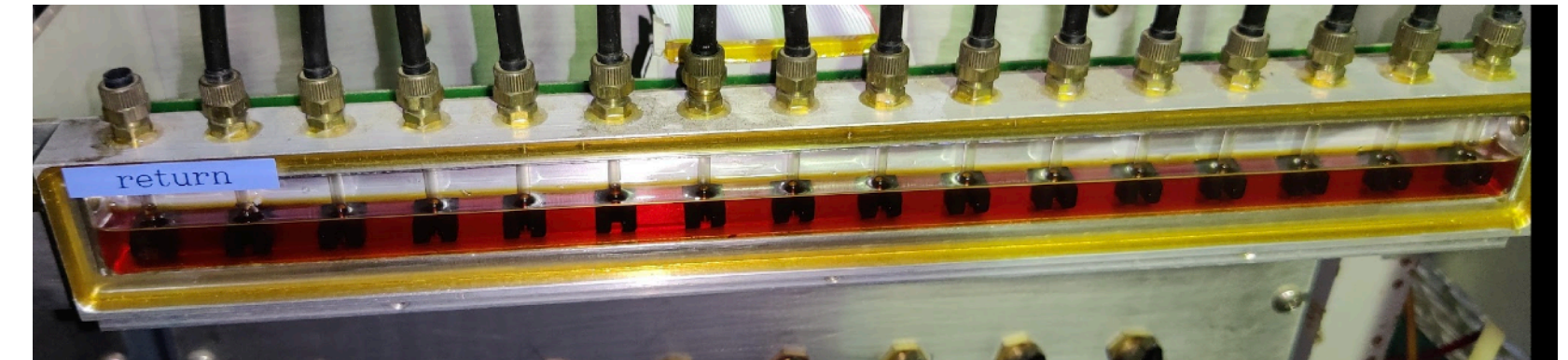
- Return side BB0,BB7,BF0,BF7 connected
  - In addition to BB3,BB4,BF3,BF4
- Power supply voltage adjusted
  - $5.06 \pm 0.01$  V to  $5.10 \pm 0.01$  V
- Two readout boards connected to same power supply(pin based)
  - One that was already connected still shows undervoltage ~once every two minute
  - Other one doesn't

# Inventory of disconnected channels

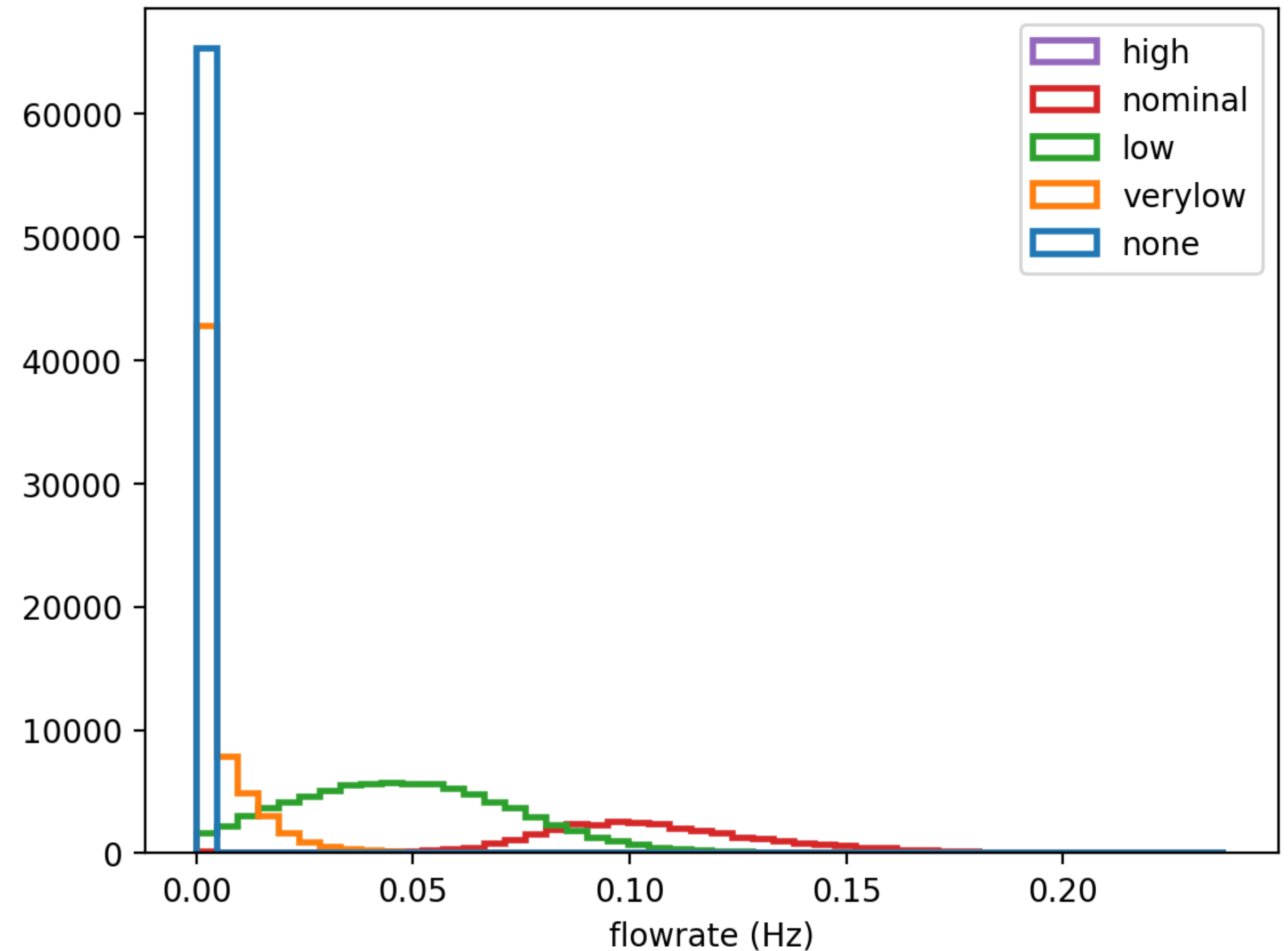
## KLM Bubbler updates

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- Some bubblers(mostly 0,1,15) have no pipes connected
  - Not consistent, so taken inventory
- Some supply panels(mostly 0,1,15) have switches turned off
  - Not consistent, so taken inventory
- To make sure we see zero flowrates in readout of those channels



- Label channels based on average flowrate and plot histogram
  - None: no flow
  - Verylow:  $< \sim 1$  bubble per minute
  - Low:  $< \sim 5$  bubbles/min
  - Nominal:  $< \sim 12$  bubbles/min
  - High: more than any of them
    - (no channels recorded to have so)



# Channel labelling by avg. flow rate

## KLM Bubbler updates

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BB3 inner return																
/var/folders/65/343qx7n94rbgfxg4r242sff80000gr/T/ipykernel_6491/3218631040.py:5: FutureWarning: Styler.applymap display(dfs_tag[pi][spi].style.applymap(colour_cell))																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
tag	none	none	verylow	low	verylow	low	low	none	none	none	low	nominal	none	nominal	low	none
BB4 inner return																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
tag	none	low	verylow	low	low	none	low	low	none	none	none	none	low	verylow	low	none
BB3 outer return																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
tag	none	none	nominal	low	low	nominal	verylow	low	low	low	low	low	nominal	low	verylow	none
BB4 outer return																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
tag	none	none	low	low	low	verylow	low	verylow	none	none	verylow	low	low	verylow	low	none
BF0 inner return																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
tag	none	none	verylow	verylow	low	low	low	nominal	nominal	nominal	low	nominal	low	low	verylow	none
BF7 inner return																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
tag	none	none	low	verylow	low	nominal	low	nominal	low	nominal	nominal	verylow	none	verylow	nominal	none
BF0 outer return																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
tag	none	none	low	low	verylow	nominal	low	low	verylow	nominal	low	low	nominal	none	none	none
BF7 outer return																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
tag	none	none	low	low	verylow	verylow	nominal	nominal	low	verylow	nominal	low	verylow	nominal	none	low
BB0 inner return																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

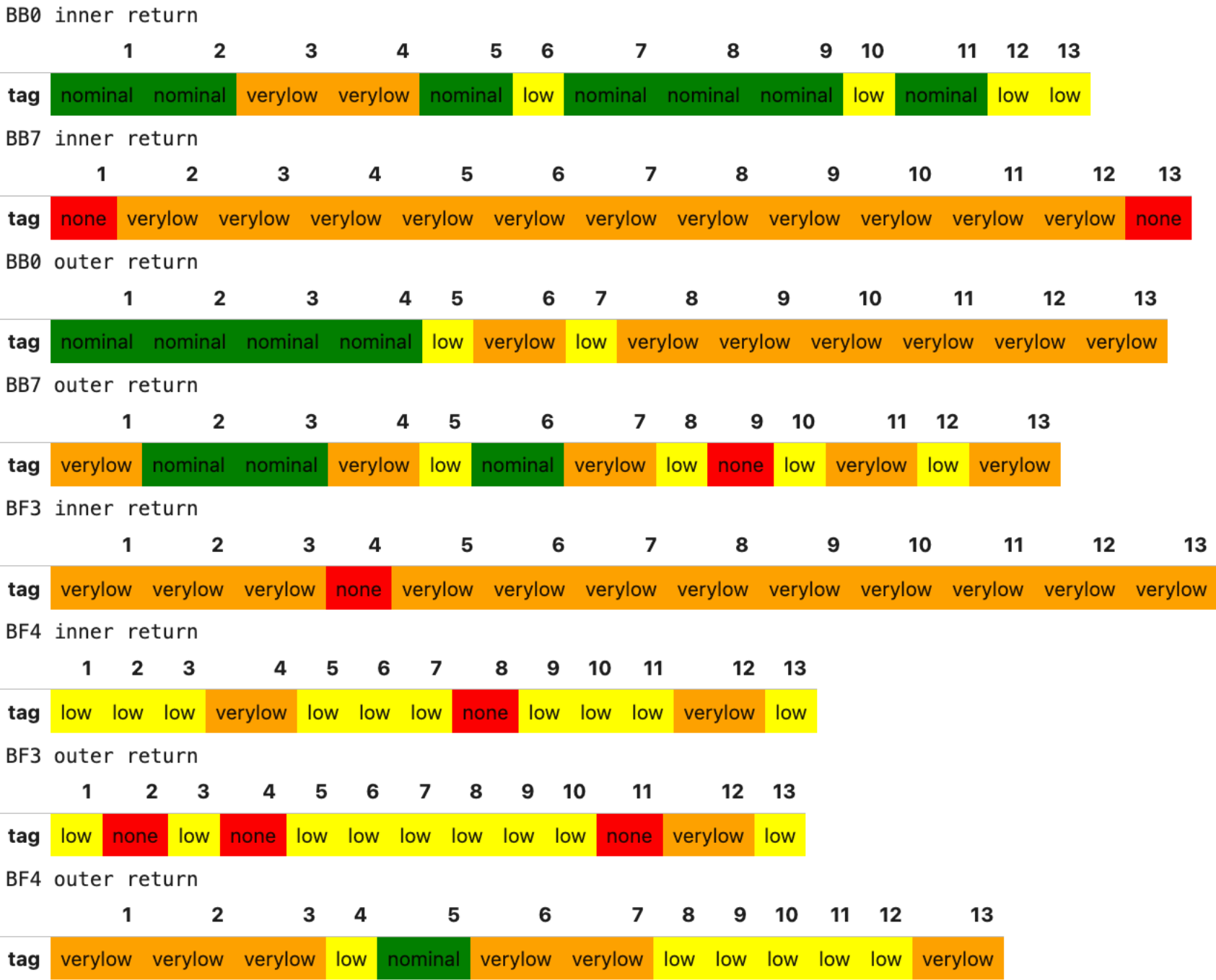
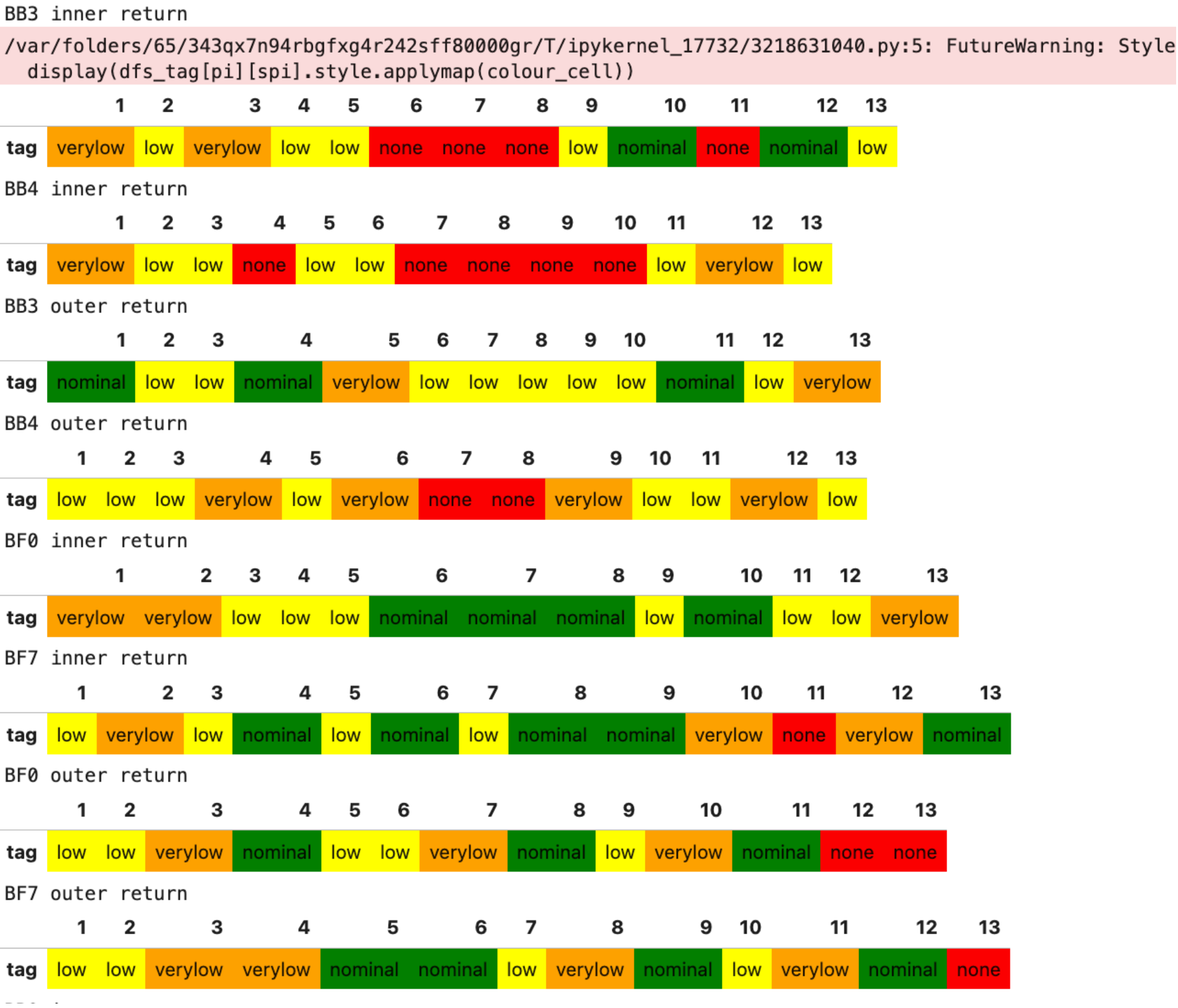
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
tag	none	none	nominal	nominal	verylow	verylow	nominal	low	nominal	nominal	nominal	low	nominal	low	low	none	
BB7 inner return																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
tag	none	none	none	verylow	verylow	verylow	verylow	verylow	verylow	verylow	verylow	verylow	verylow	verylow	verylow	none	none
BB0 outer return																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
tag	none	none	nominal	nominal	nominal	nominal	low	verylow	low	verylow	verylow	verylow	verylow	verylow	verylow	verylow	none
BB7 outer return																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
tag	none	none	verylow	nominal	nominal	verylow	low	nominal	verylow	low	none	low	verylow	low	verylow	none	
BF3 inner return																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
tag	none	verylow	verylow	verylow	verylow	none	verylow	verylow	verylow	verylow	verylow	verylow	verylow	verylow	verylow	verylow	none
BF4 inner return																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
tag	none	none	low	low	low	verylow	low	low	low	none	low	low	low	verylow	low	none	
BF3 outer return																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
tag	none	none	low	none	low	none	low	low	low	low	low	low	none	verylow	low	none	
BF4 outer return																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
tag	none	none	verylow	verylow	verylow	low	nominal	verylow	verylow	low	low	low	low	low	verylow	none	

(Index -> # bubbler; bubblers with no inflow pipe not subtracted)

# Channel labelling by avg. flow rate

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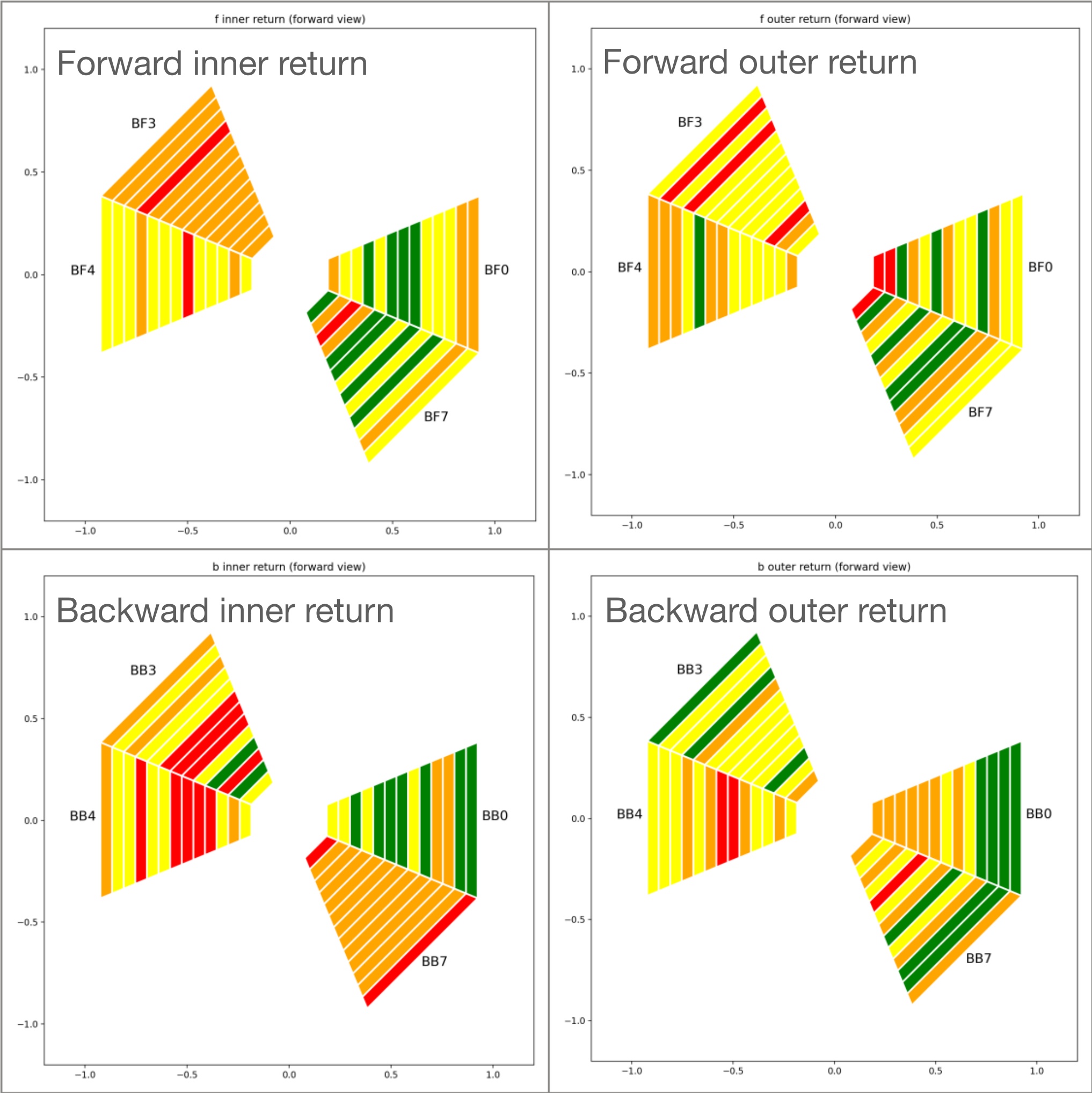


(Index -> RPC layer; maping heuristic)

# Channel labelling by avg. flow rate

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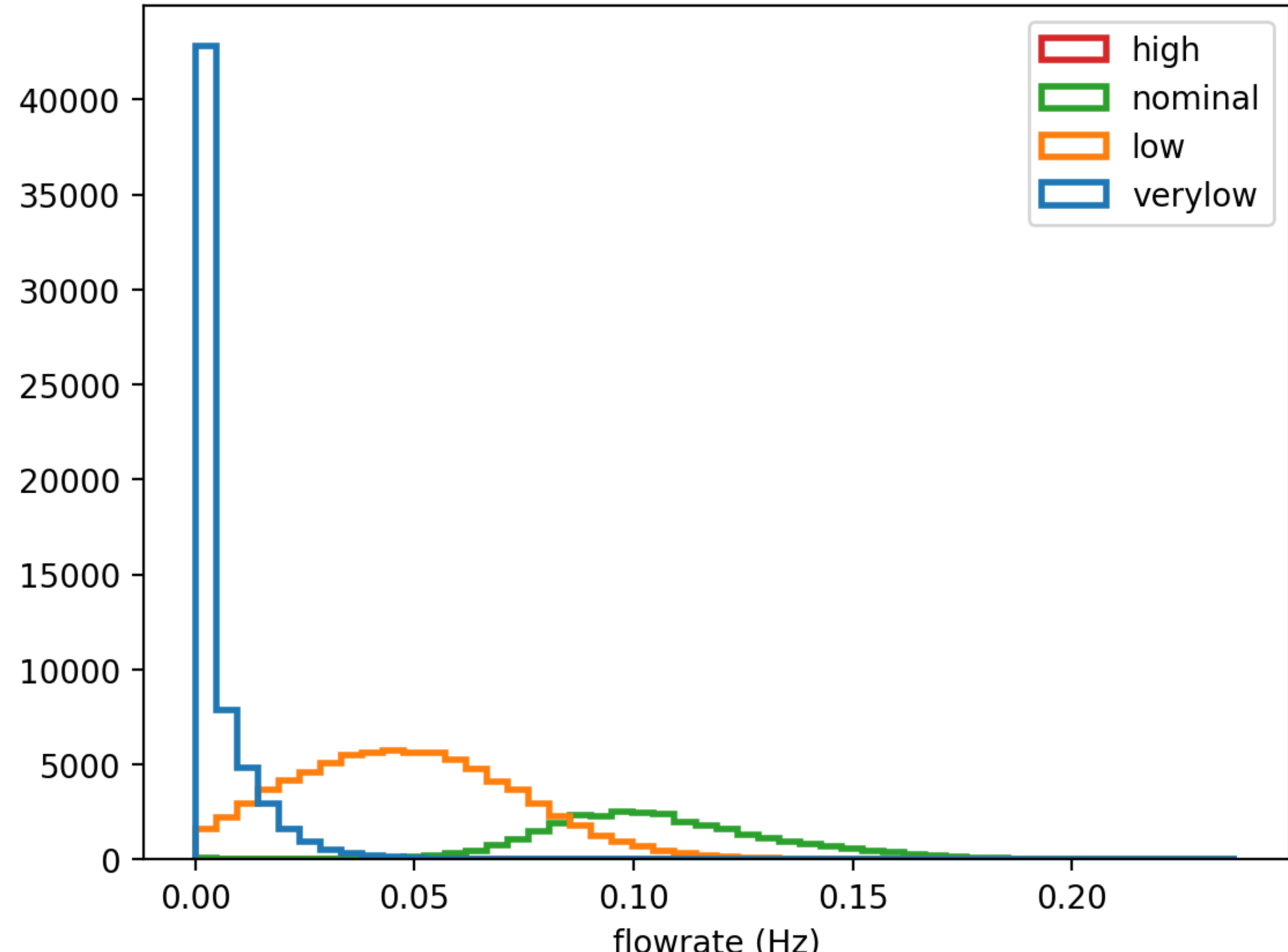
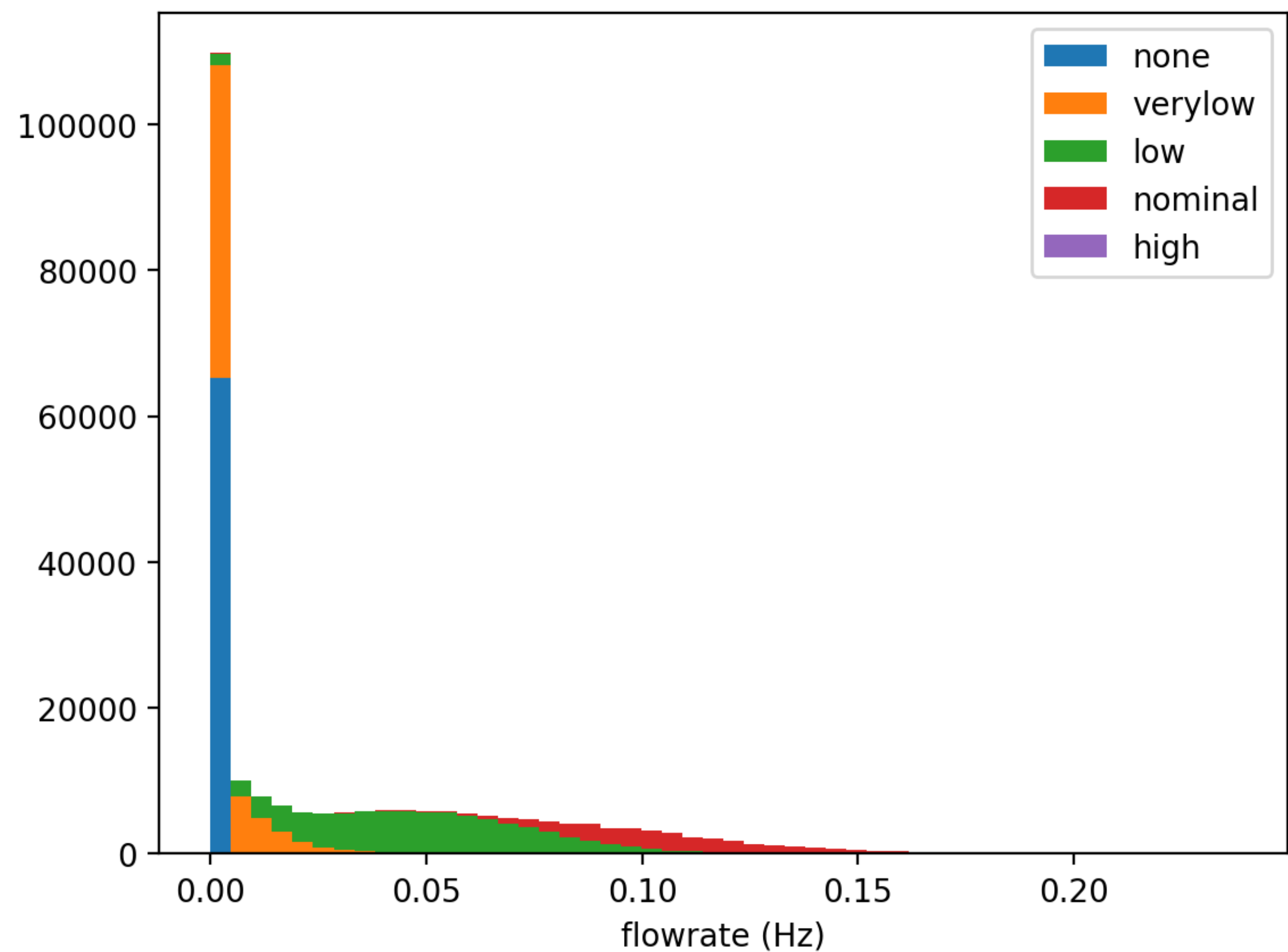


(RPC layer mapping heuristic)

# Flowrate histogram

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# Flowrate histogram

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