

DAQ Deadtime Scan

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UNH

Testing Procedure

- Spectrometer momentums set at 1.68 GeV/c
 - High rates, good focal plane coverage
- Carbon foil target in
- Only main HRS triggers enabled
 - T1 on RHRS
 - T3 on LHRS
 - ALL other prescale factors set to zero
- Changed beam current to adjust rate

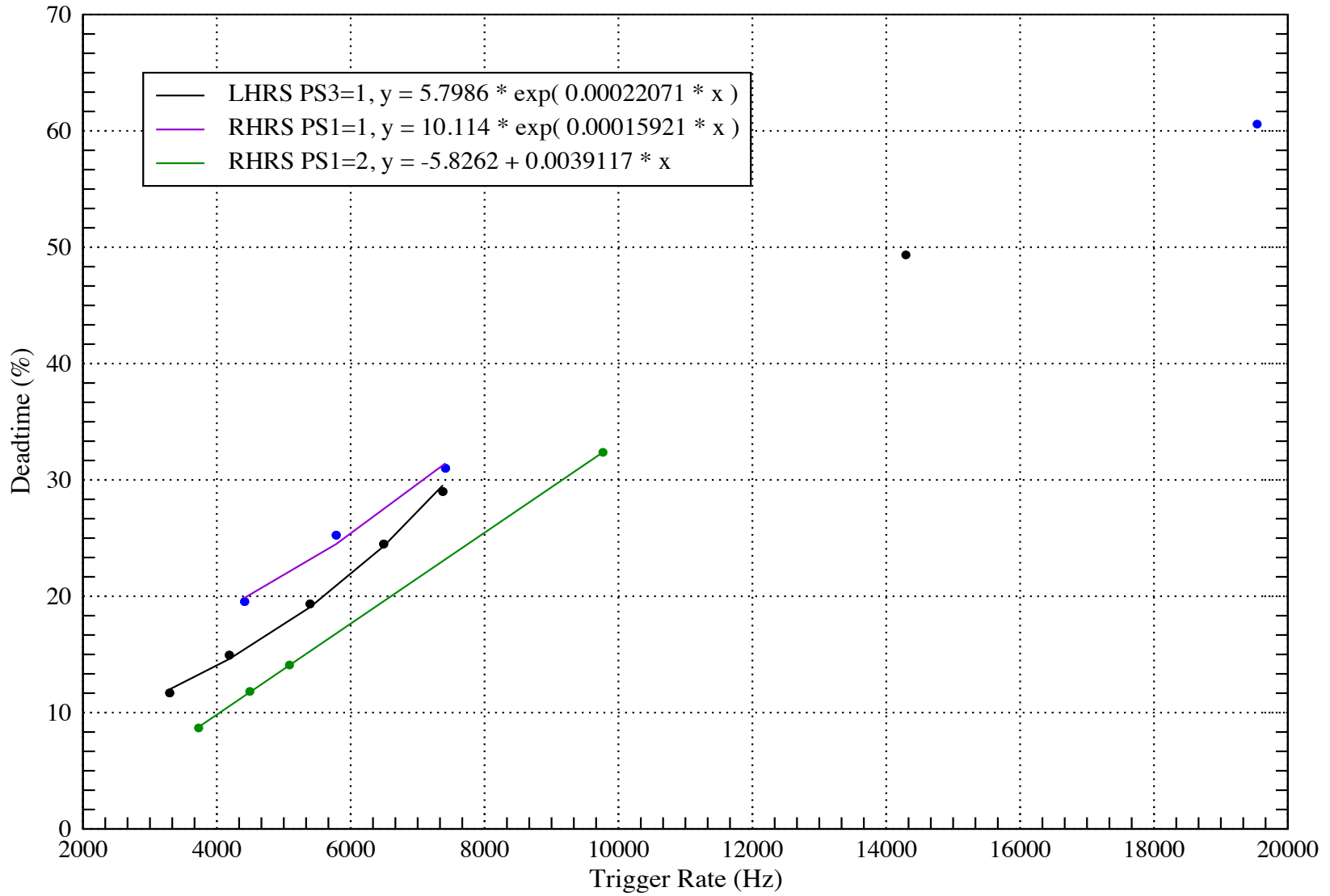
Results - LHRS

Beam Current	Raw Trig Rate (kHz)	Prescale	Trig Rate (kHz)	Deadtime(%)
1 μ A	14.2	1	14.2	49
1 μ A	14.2	2	7.1	19
1 μ A	14.2	3	4.7	6.4
1 μ A	14.2	4	3.6	1.5
1 μ A	14.2	5	2.8	.6
500nA	7.3	1	7.3	29
500nA	7.4	2	3.7	4.5
450nA	6.4	1	6.4	24
350nA	5.4	1	5.4	19
350nA	5.4	1	5.4	20
300nA	4.2	1	4.2	15
200nA	3.2	1	3.2	12

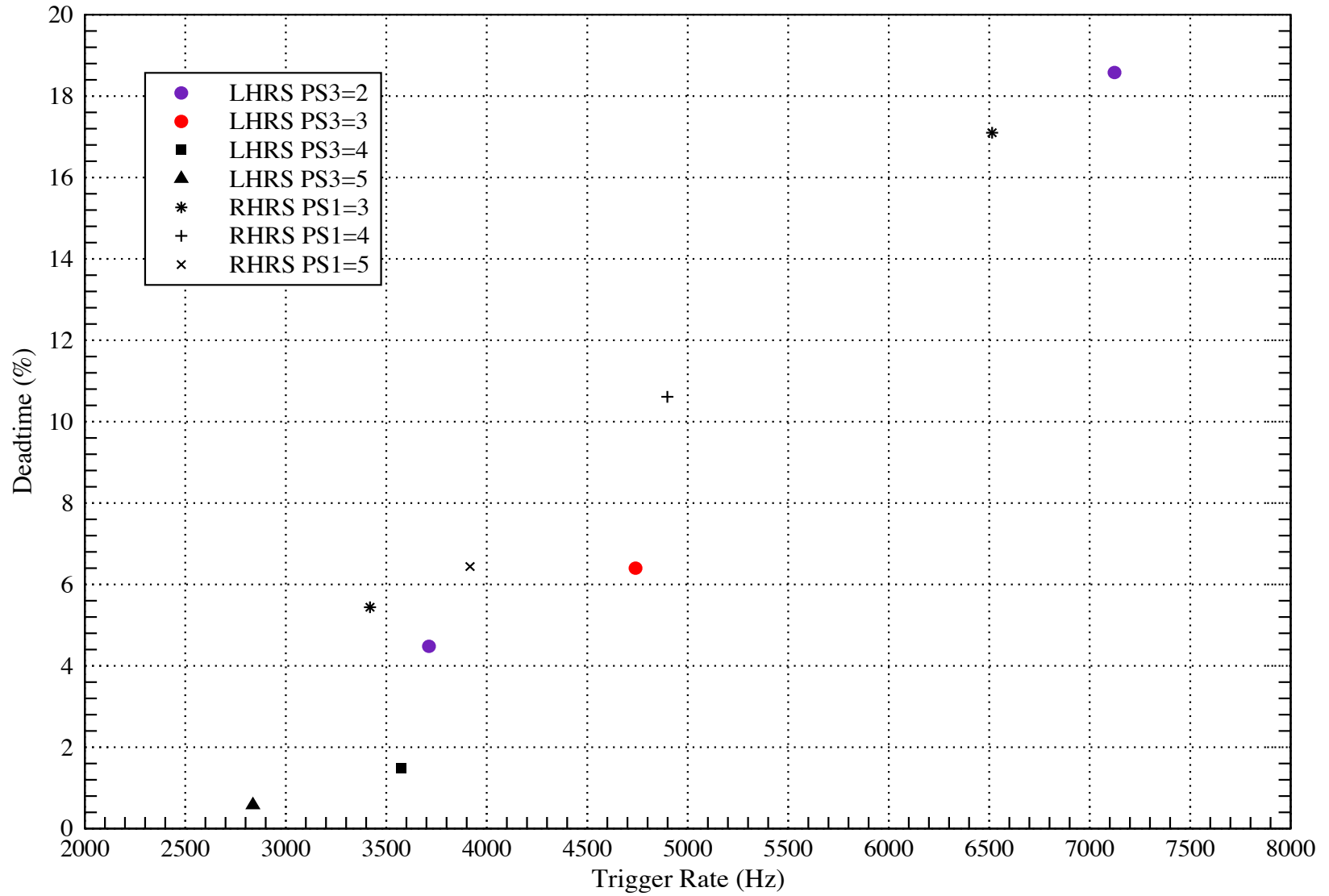
Results - RHRS

Beam Current	Raw Trig Rate (kHz)	Prescale	Trig Rate (kHz)	Deadtime(%)
1 μ A	19.5	1	19.5	61
1 μ A	19.5	2	9.7	32
1 μ A	19.5	3	6.5	17
1 μ A	19.5	4	4.9	11
1 μ A	19.5	5	4	6
500nA	10	2	5	14
500nA	10.2	3	3.4	5
450nA	9	2	4.5	12
350nA	7.4	1	7.4	31
350nA	7.4	2	3.7	9
300nA	5.7	1	5.7	25
200nA	4.4	1	4.4	20

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ROC Busy Times

Note: Measured with cosmics

LHRS

	Encoding Time	Readout Time	Comments
Roc 3	9 μs	50.4 μs	8 TDCs (block read), 1 ADC
Roc 4	9 μs	52.0 μs	8 TDCs (block read), 1 ADC
Roc 5	11.8 μs	90.4 μs	2TDC, 4 ADC (3 are in block read)

Event Length = ~ 210 words

RHRS

	Encoding Time	Readout Time	Comments
Roc 1	11.2 μs	96 μs	9 TDCs, 3 ADCs all block read
Roc 2	11.2 μs	54 μs	10 TDCs, 2 ADCs block read

Event Length = ~ 260 words

Moving Forward

- Achieved 6 kHz with $\sim 20\%$ deadtime on LHRS
- Remove two stand-alone TDC's from ROC5 and move one of each into ROC 3/ROC 4
 - ROC5 Readout Time – 62 μs
 - ROC4 Readout Time – 64 μs
 - ROC3 Readout Time – 62.4 μs
- Add third FASTBUS crate to RHRS
- Increase pedestal values on unused ADC channels