

ATF October 2014 shift plan

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Introduction

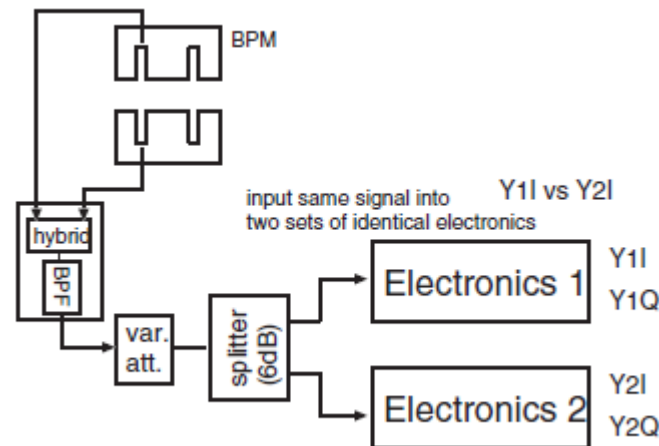
- Plan assumes existing IP BPMs with Honda's electronics
- Two parts:
 - Estimating Honda's electronics system noise by using 2 processors on one BPM
 - Performance of IPB and IPC with waist at IP

Shifts

- FONT team at ATF:
 - Glenn Christian Tue 21st Oct – Sun 26th Oct
 - Neven Blaskovic Sun 19th Oct – Sat 1st Nov
- We have been allocated 3½ shifts for the first week:
 - Wednesday owl (0100–0900)
 - Thursday owl (0100–0900)
 - Friday owl and ½ day (0100–1300)

2-on-1 resolution study

- Use 2 processors on one BPM to estimate resolution limit due to electronics noise (Inoue et al., 2008):



2-on-1 resolution study

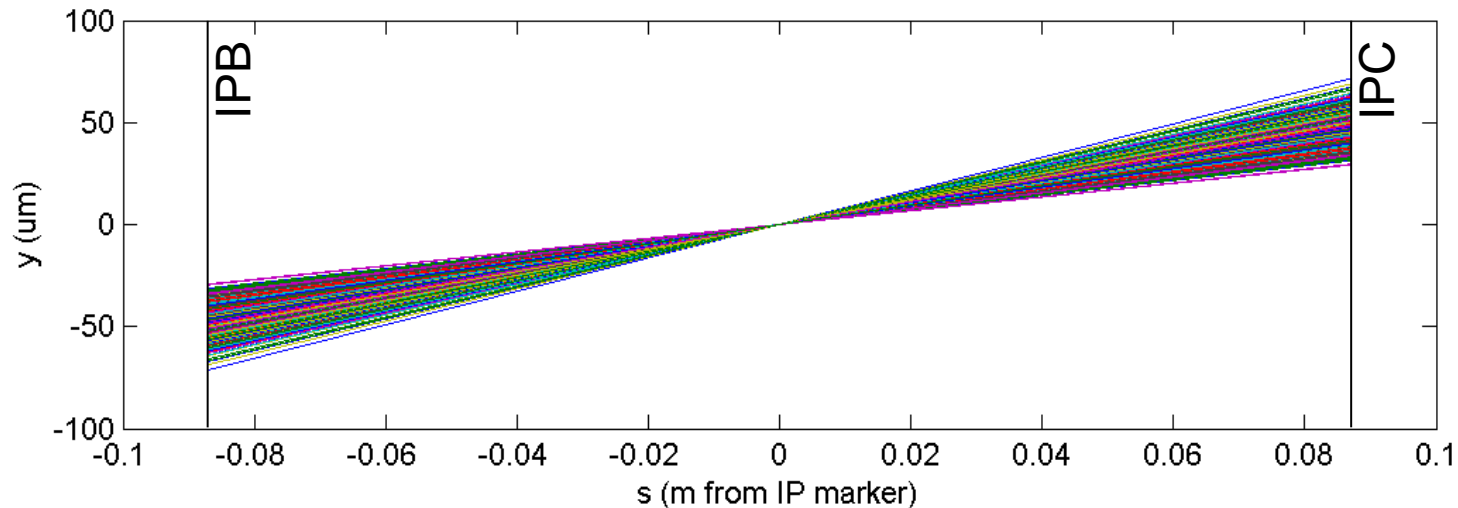
- Shift time would be required to:
 - Calibrate with beam waist on BPM
 - Get 2-on-1 resolution data on and off-waist
 - Get 2-on-1 resolution data vs. mover position
 - Study resolution vs. attenuation
 - Permute pairs of electronics
 - Repeat but have a common Honda 1st stage and then split into two Honda 2nd stages

2-on-1 resolution study

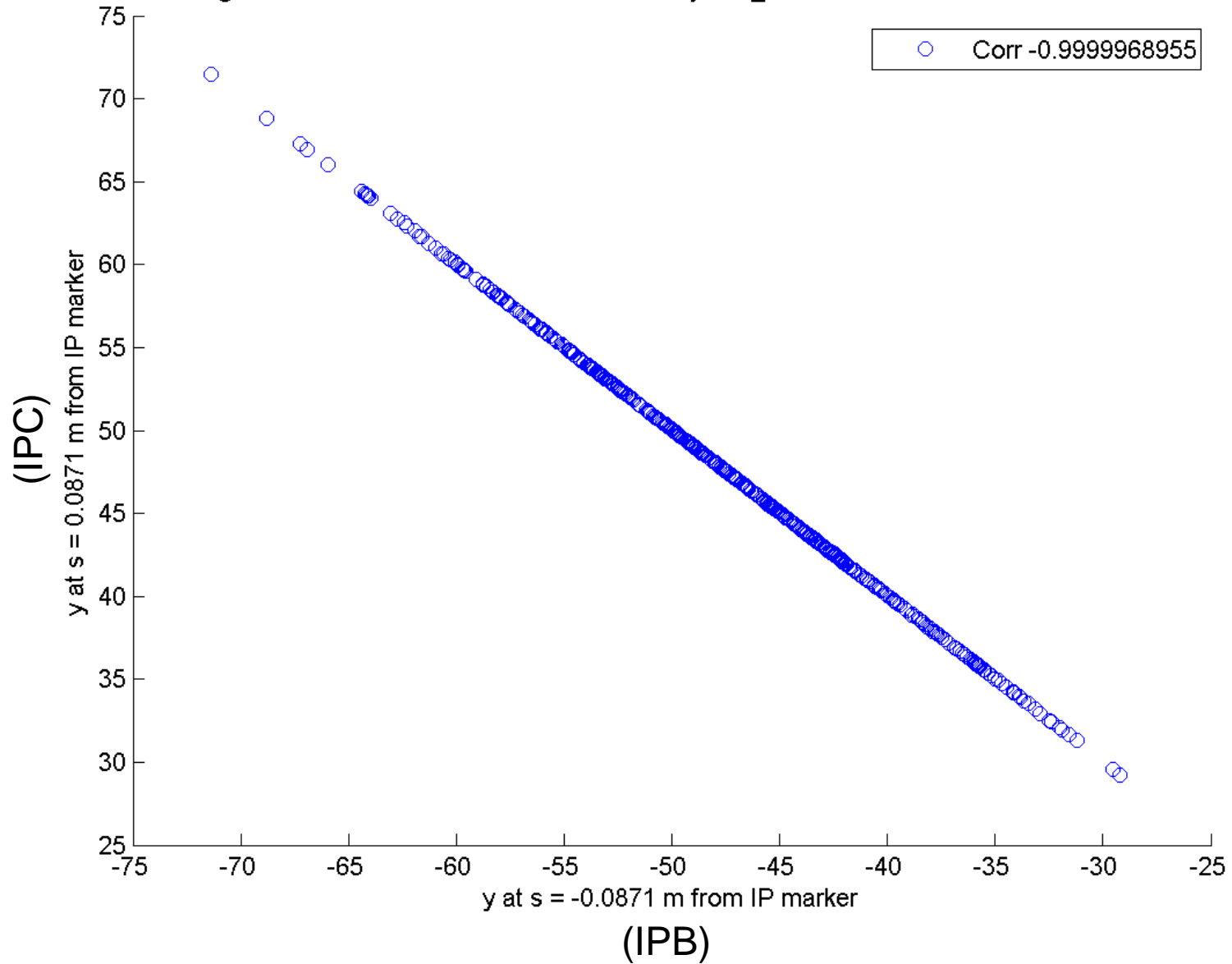
- Study requires single FONT5 board for local digitisation at IP
- Study also requires IP BPM mover control

IPB and IPC resolution study

- With waist at nominal IP, propagation of upstream P2 and P3 positions gives
 - 8 μm jitter at IPB & IPC; 9 nm jitter at IP
 - $\sim 100\%$ position correlation of IPB to IPC



Position correlation at s of 0.0871 m vs. -0.0871 m from IP marker
by tracking P2 and P3 positions for fbRun1 on 310114 using only FbOff data for bunch 2
using linear transfer matrices from setfile set14jan31_0523 with 0.00797 m extra drift to IP



IPB and IPC resolution study

- Parasitic study with beam waist at IP:
 - Centre IPB and IPC around beam
 - Measure jitter at IPB and IPC vs. attenuation
 - Estimate system resolution vs. attenuation
(given ~100% IPB-to-IPC position correlation, IPB & IPC are ~ measurements of the same)
 - Assess limitation of dynamic range
- Shift time would be required to:
 - Calibrate with beam waist on each BPM

IPB and IPC resolution study

- Digitise:
 - Upstream stripline BPMs P2 and P3
 - IP BPMs IPB and IPC
- Study requires IP BPM mover control
- Study preferentially performed with tuned beam of known spot size

Hardware

- Hardware to be taken to ATF:
 - FONT5 board #1
 - n FONT5A boards
 - 2 ZPUL kicker amplifiers
 - USB device server
 - Variable attenuators and controller box (?)

Summary

- Study with 2 processors on one BPM
 - Requires shift time
 - Tuned beam not critical
- Performance of IPB & IPC with waist at IP
 - Mostly parasitic if beam within mover range
 - Tuned beam preferred