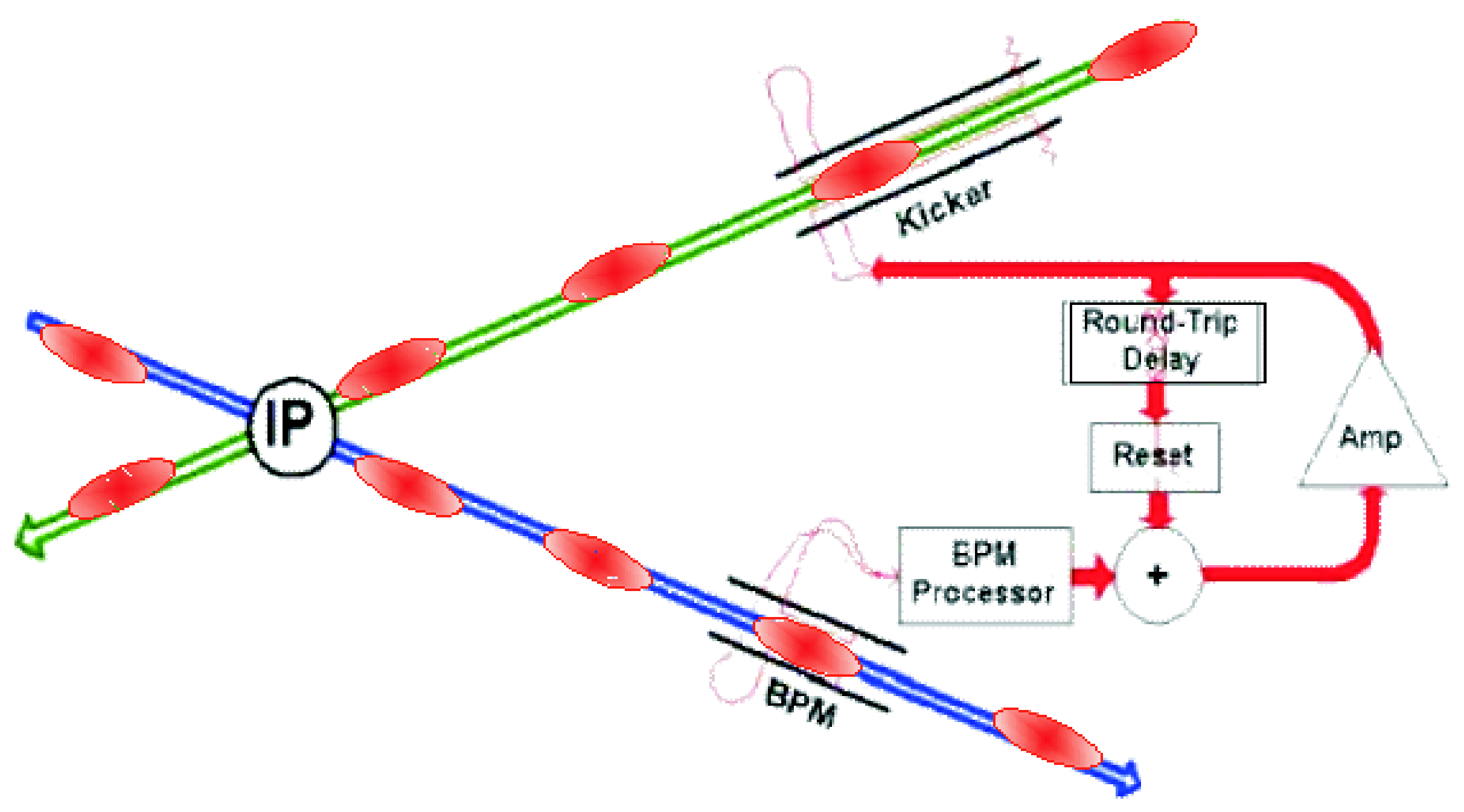


Design of the ILC Prototype FONT4 Digital Intra-Train Feedback System

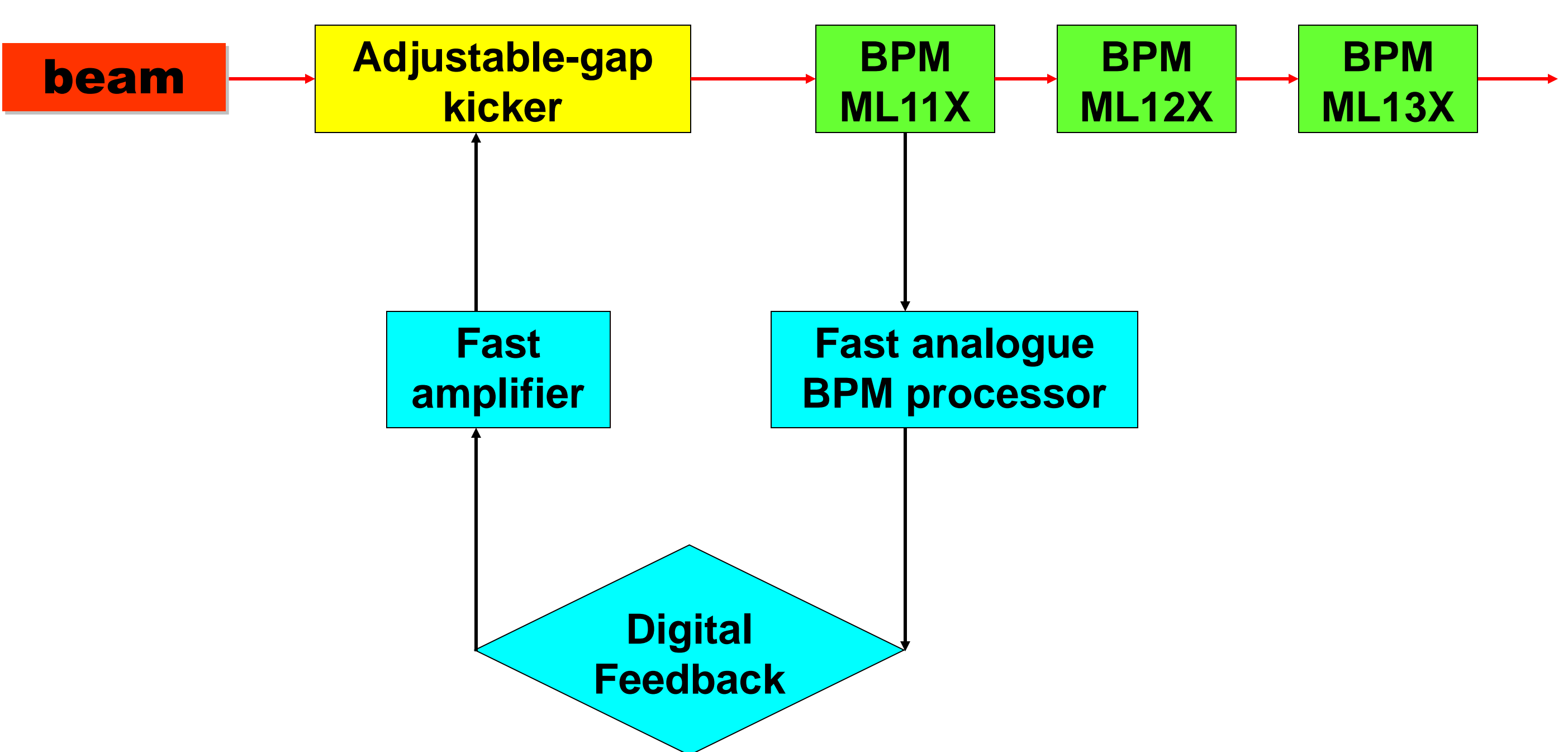
**P.N. Burrows, G. Christian, C. Clarke, H. Dabiri Khah,
T. Hartin, C. Perry, G.R. White**
(John Adams Institute, Oxford University)
A. Kalinin (Daresbury Laboratory)
D. McCormick, S. Molloy, M. Ross (SLAC)

Linear Collider intra-train feedback concept:

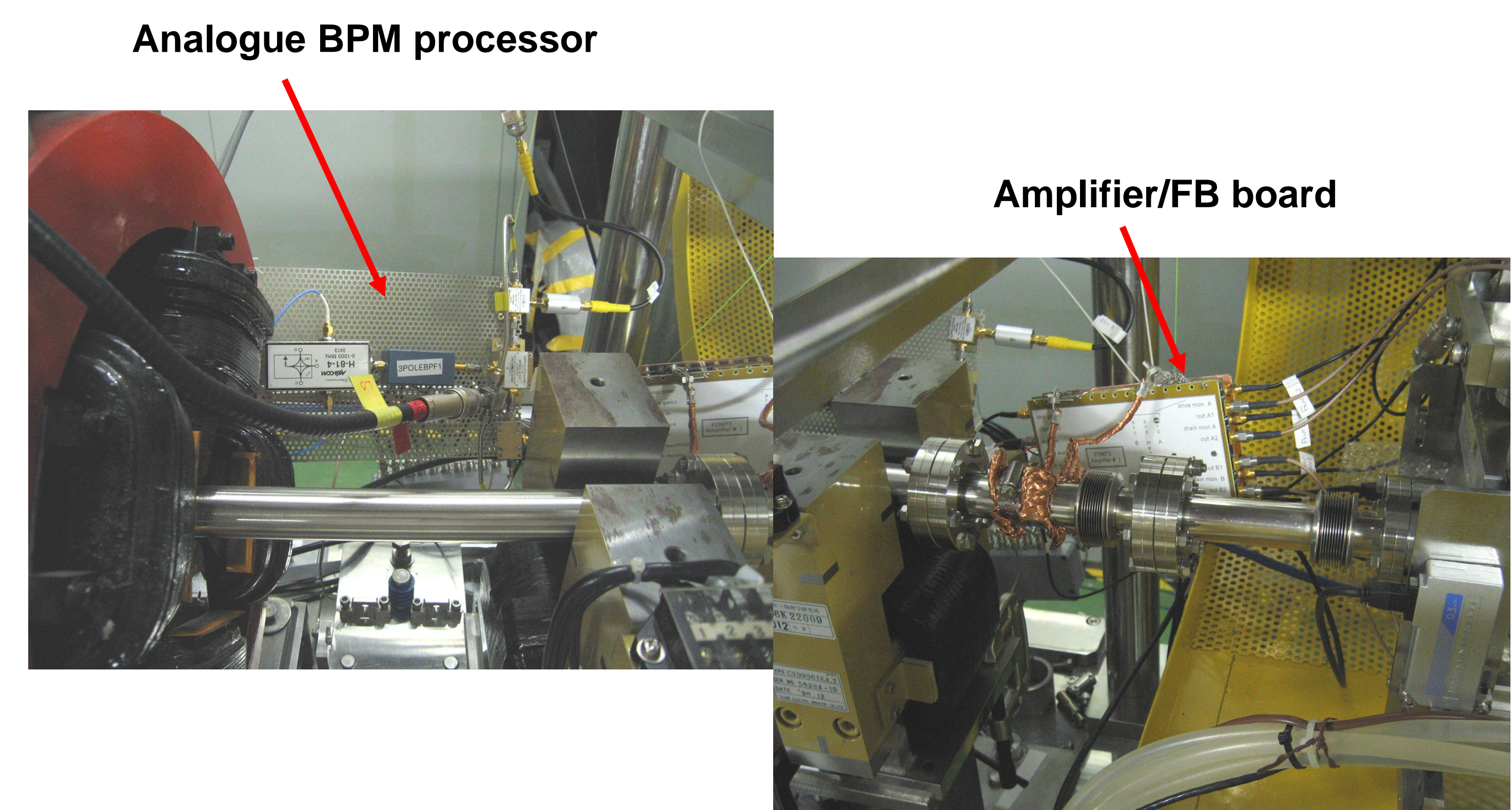


Detect position offset of incoming bunches early in train. Calculate correction and apply with kicker to later bunches

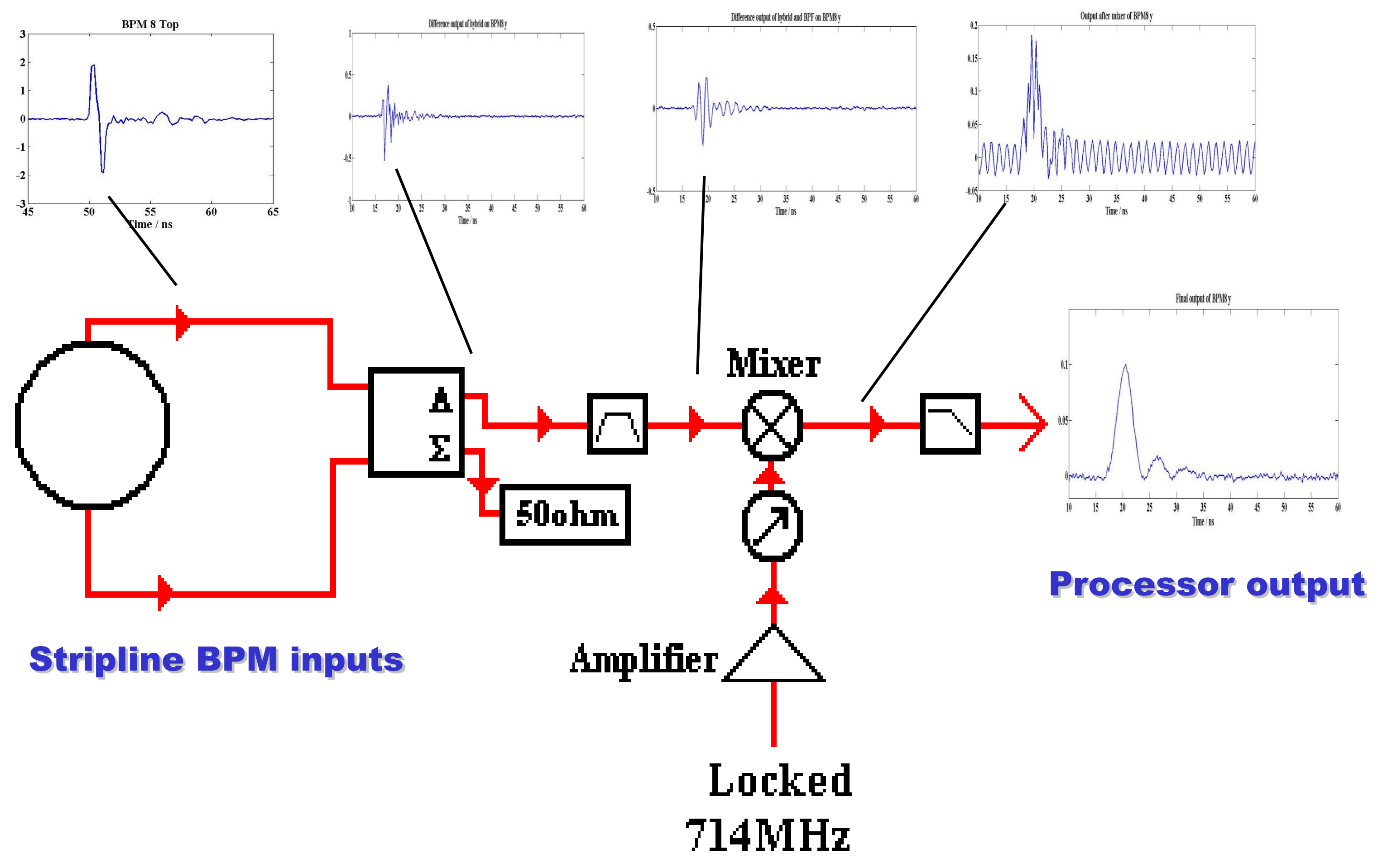
FONT4 digital prototype at KEK ATF:



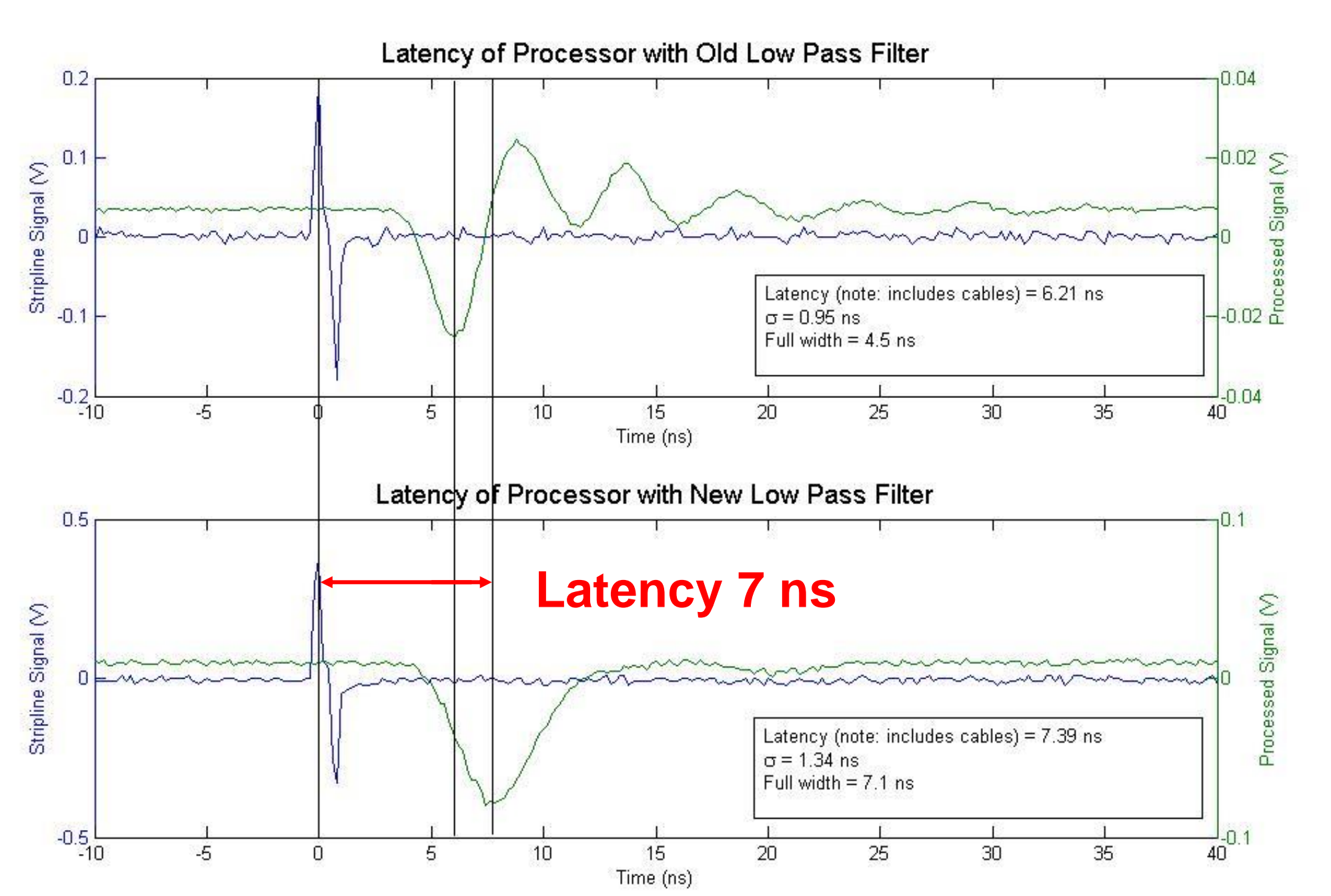
ATF extraction line:



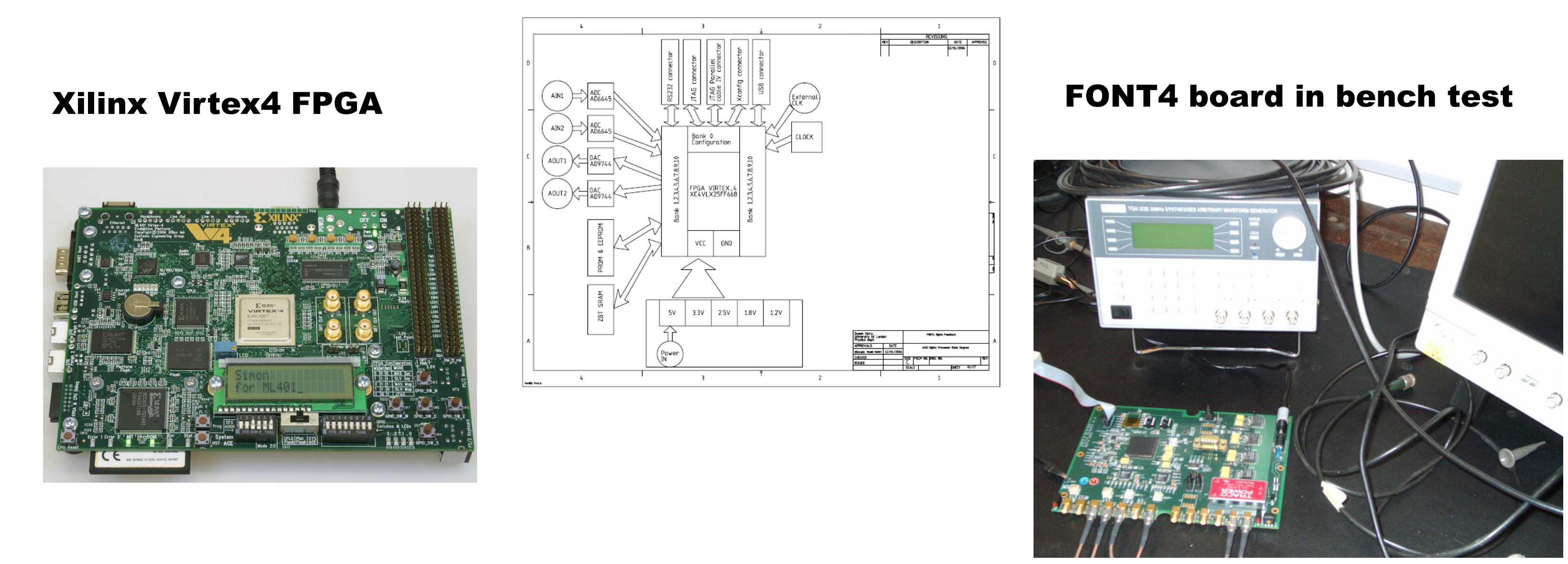
Analogue BPM signal processor:



FONT3 processor
FONT4 processor



Digital feedback processor design:



Latency budget:

Time of flight kicker - BPM:	7ns
Signal return time BPM - kicker:	15ns
Irreducible latency:	22ns
BPM processor:	7ns
ADC/DAC:	40ns
FPGA processing:	25ns
I/O:	3ns
Amplifier:	40ns
Kicker fill time:	3ns
Electronics latency:	118ns
Total latency budget:	140ns

Beam test results:

