

Intra-train FB/FF hardware status for ATF2

Philip Burrows

John Adams Institute

Oxford University

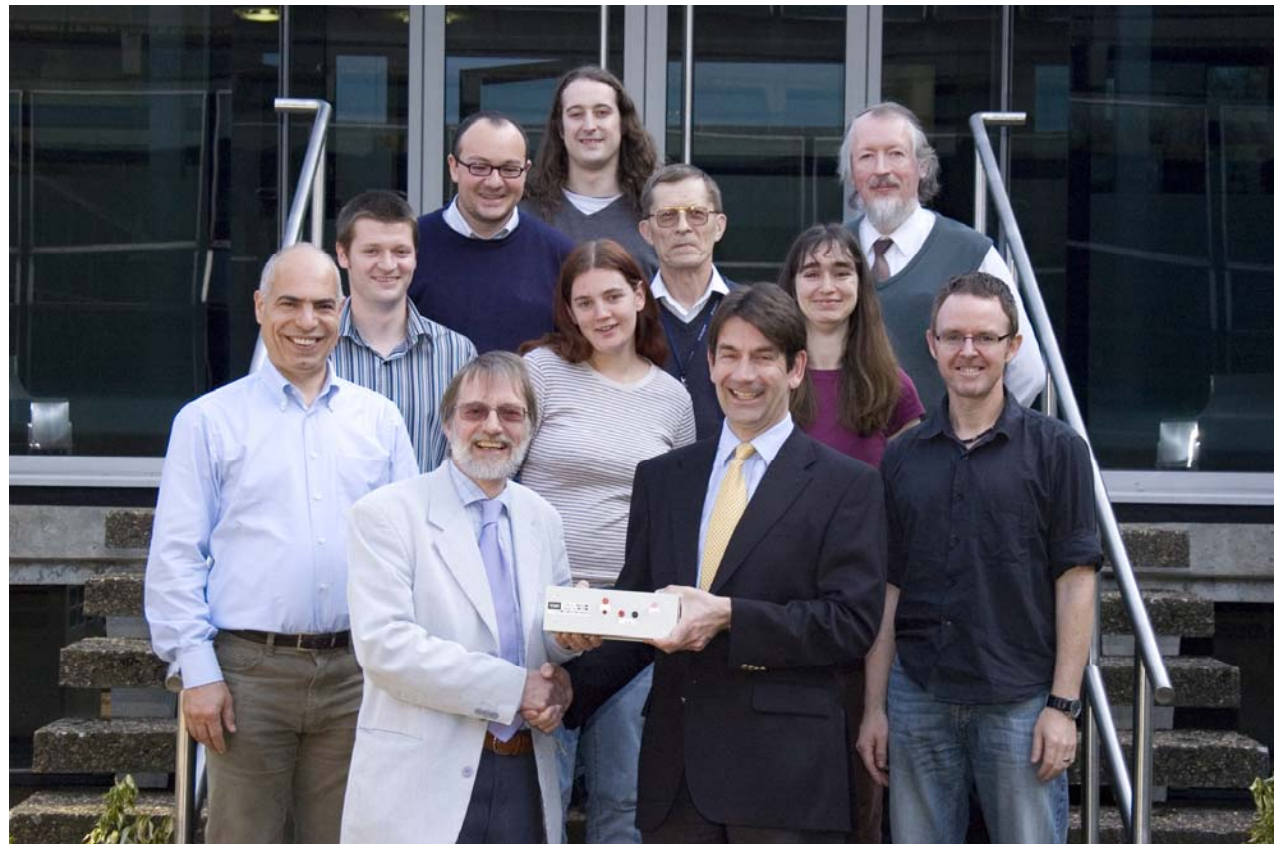
FONT Collaboration

Oxford + Daresbury:

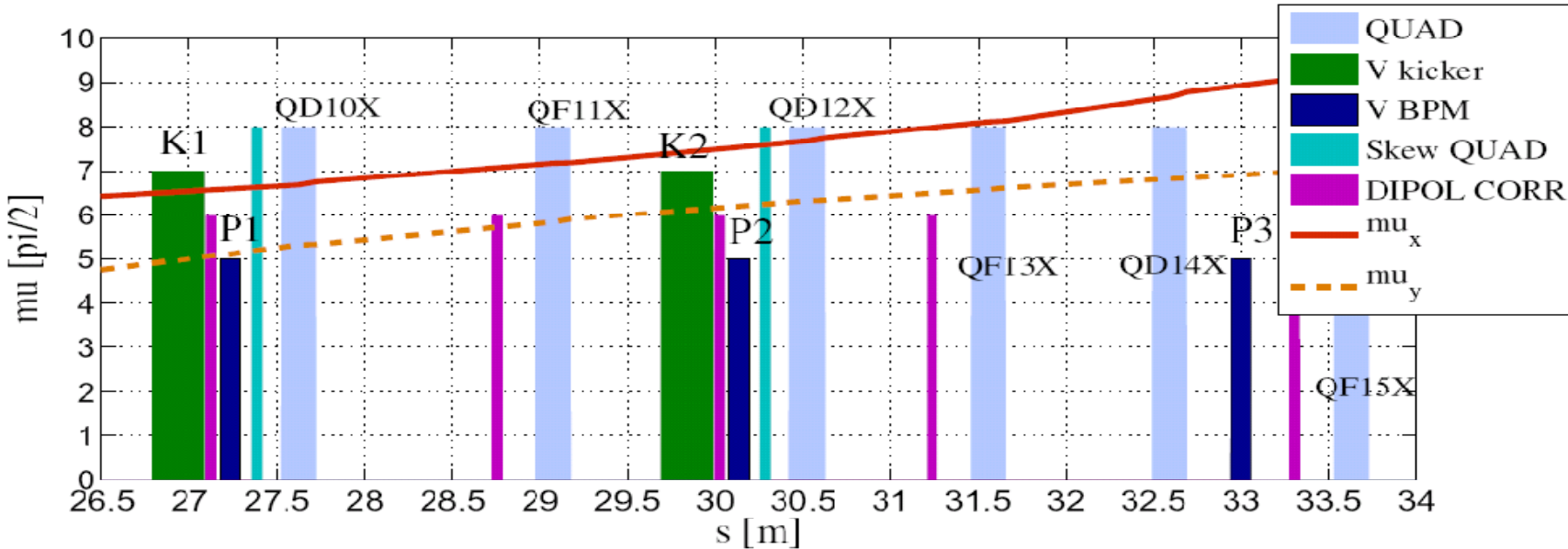
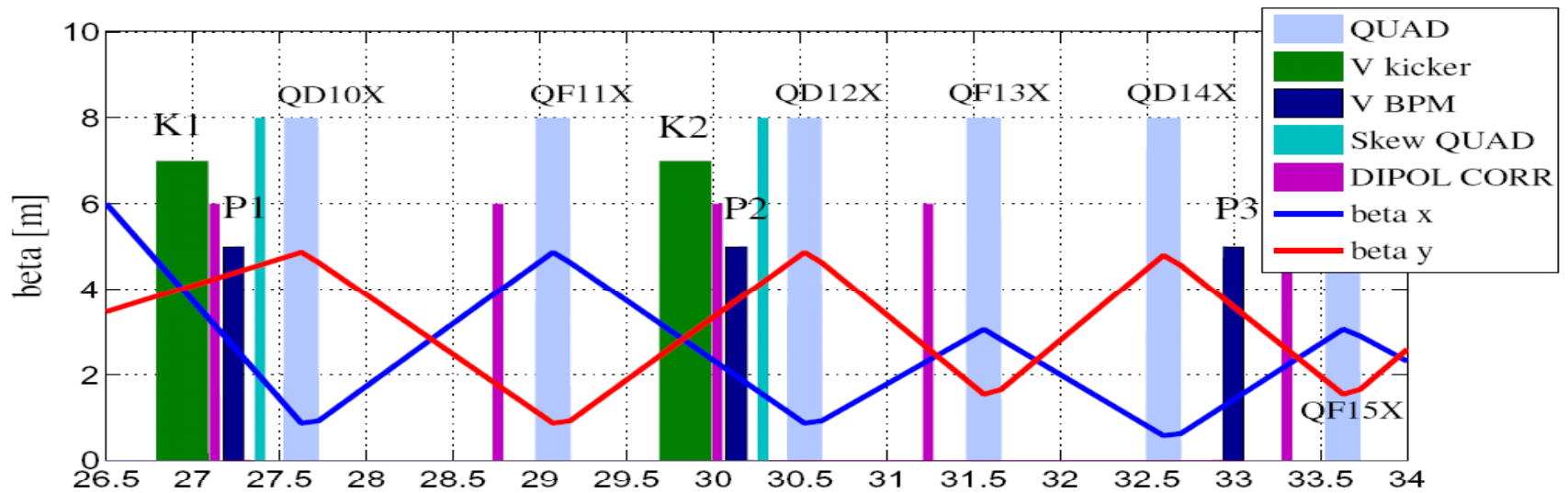
**Philip Burrows
Glenn Christian
Hamid Dabiri Khah
Tony Hartin
Alexander Kalinin
Javier Resta Lopez
Colin Perry**

**Graduate students:
Christine Clarke
Christina Swinson
Ben Constance
Robert Apsimon**

SLAC, KEK, DESY, CERN

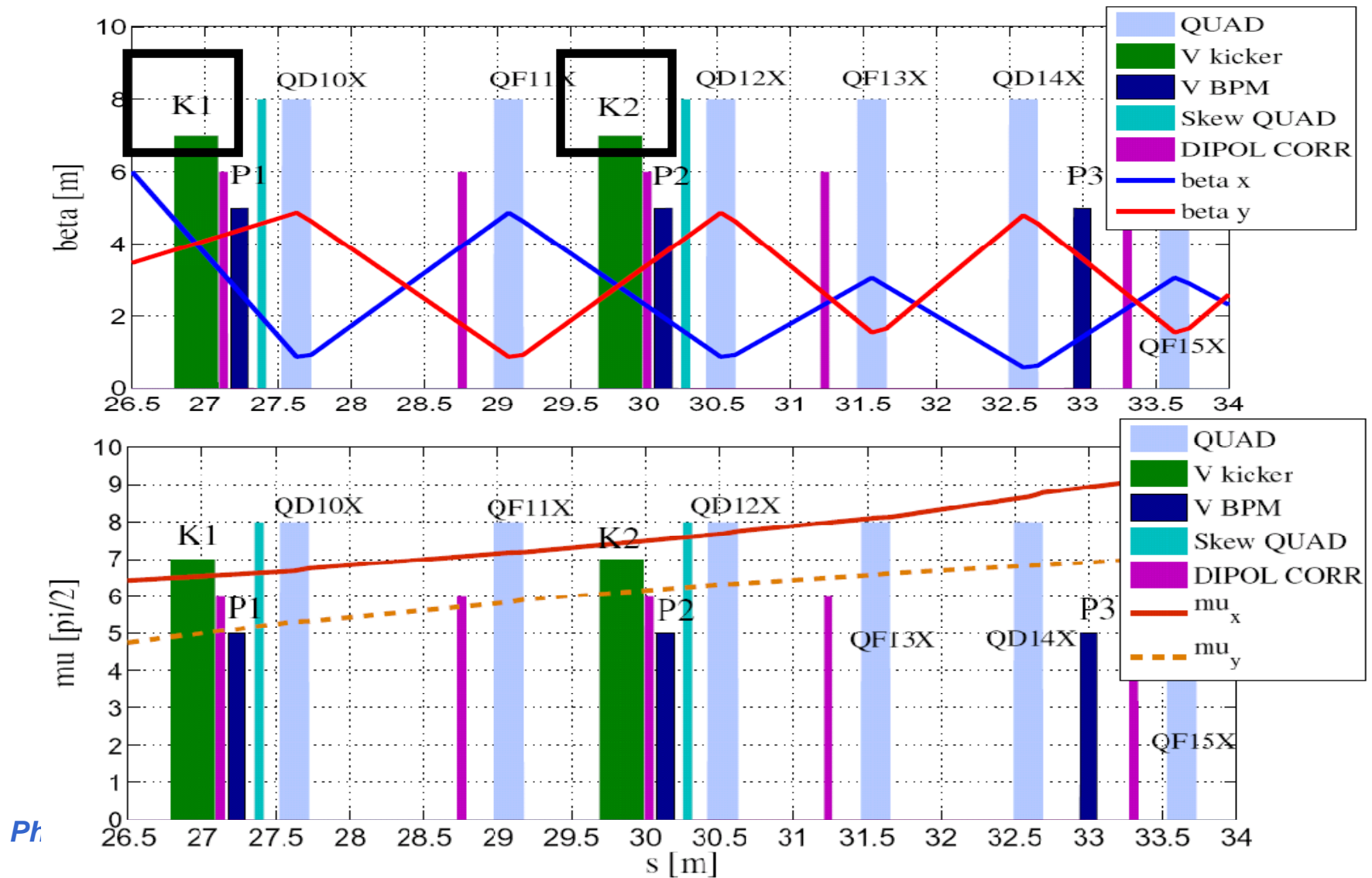


Layout of FB/FF components at ATF2 (FONT group – Resta Lopez)

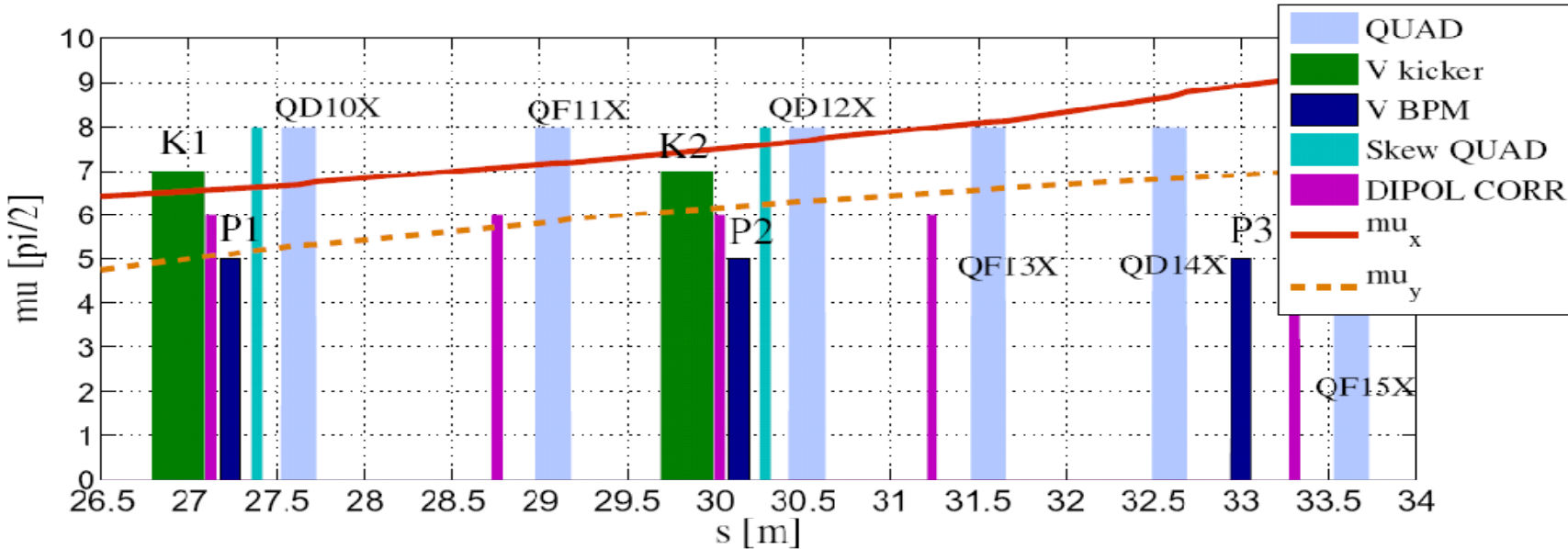
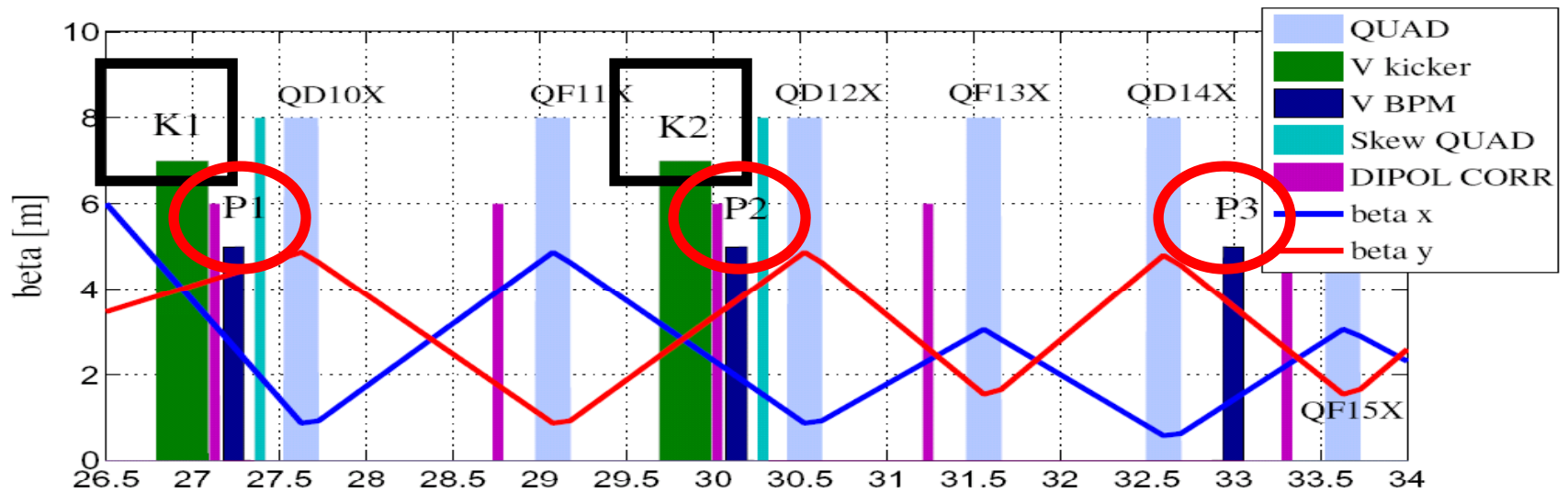


Ph

Layout of FB/FF components at ATF2 (FONT group – Resta Lopez)



Layout of FB/FF components at ATF2 (FONT group – Resta Lopez)



Ph

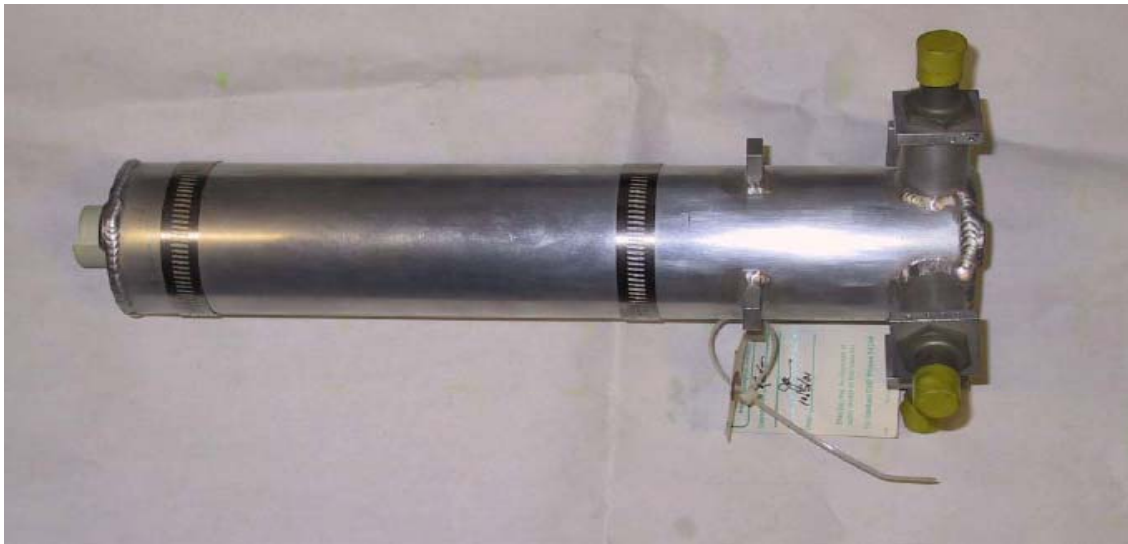
ATF2 system hardware

Dedicated system:

- **2 stripline kickers**
fast drive amplifiers
- **3 stripline BPMs**
fast analogue front-end electronics
- **Digital FB processor(s)**

ATF2 feedback hardware: kickers

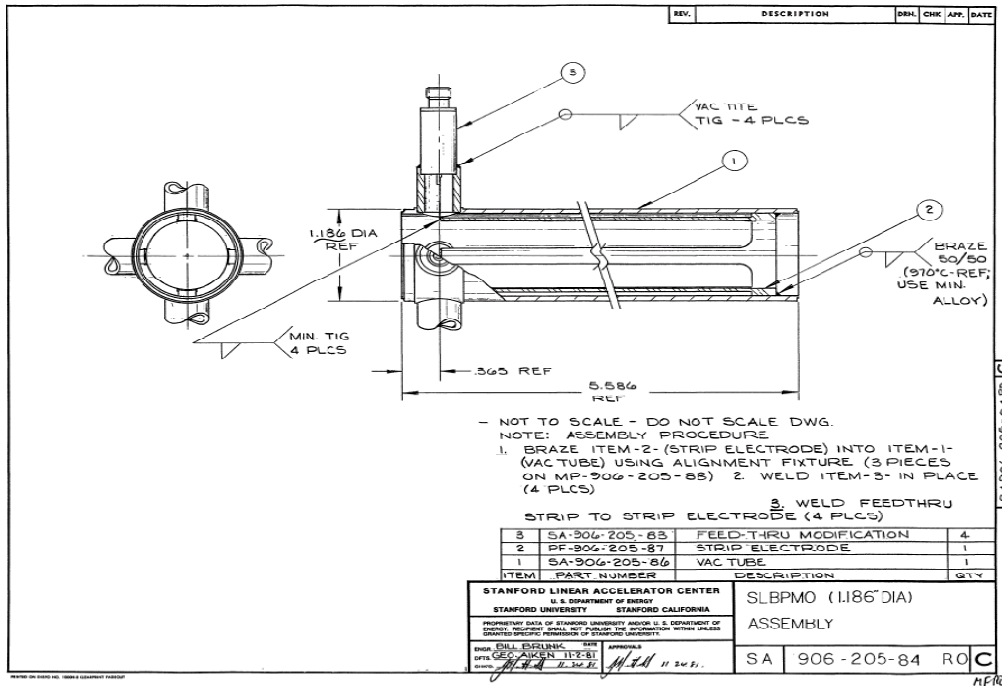
Re-use SLAC kickers from FONT1,2 at NLCTA



Two kickers in Oxford for preparation for ATF2
beamline

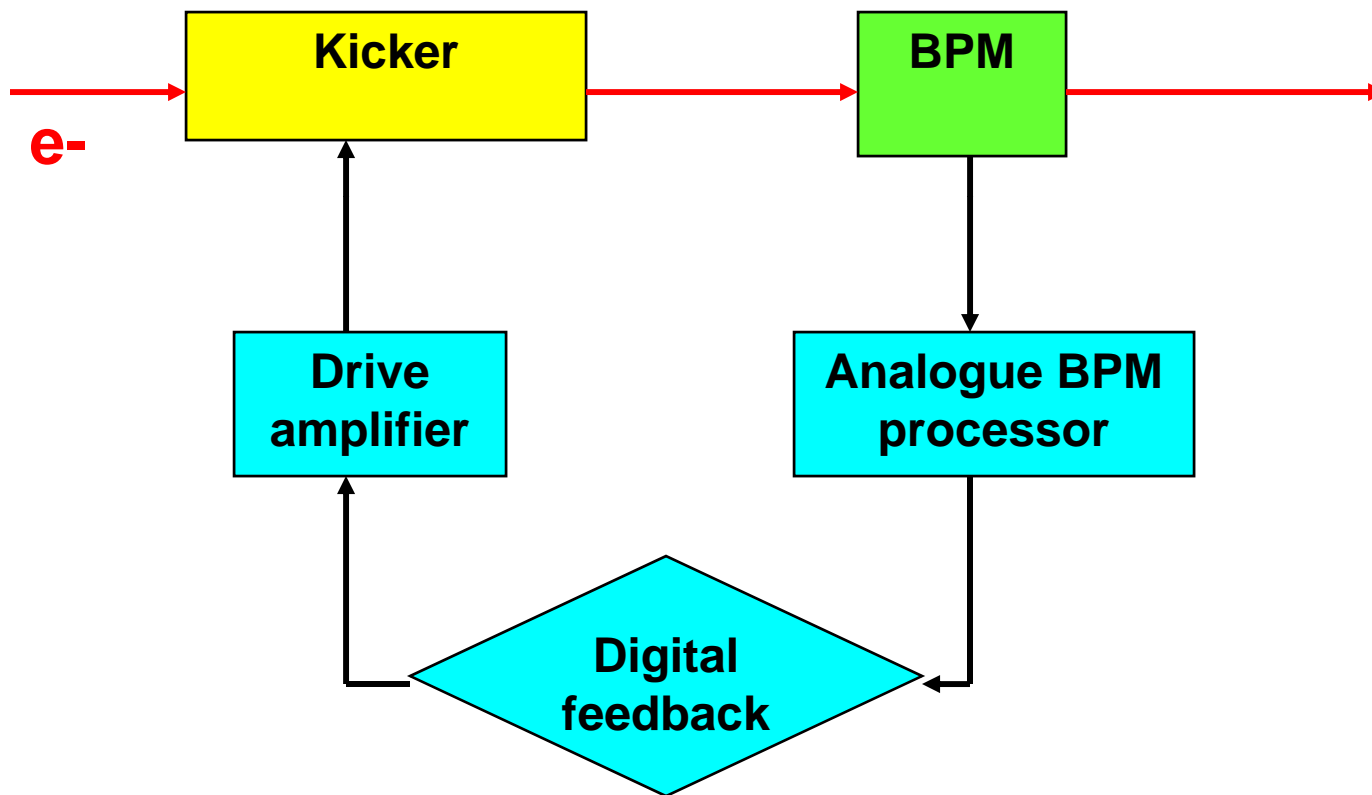
ATF2 feedback hardware: BPMs

Require 3 stripline BPMs length c. 5-15cm

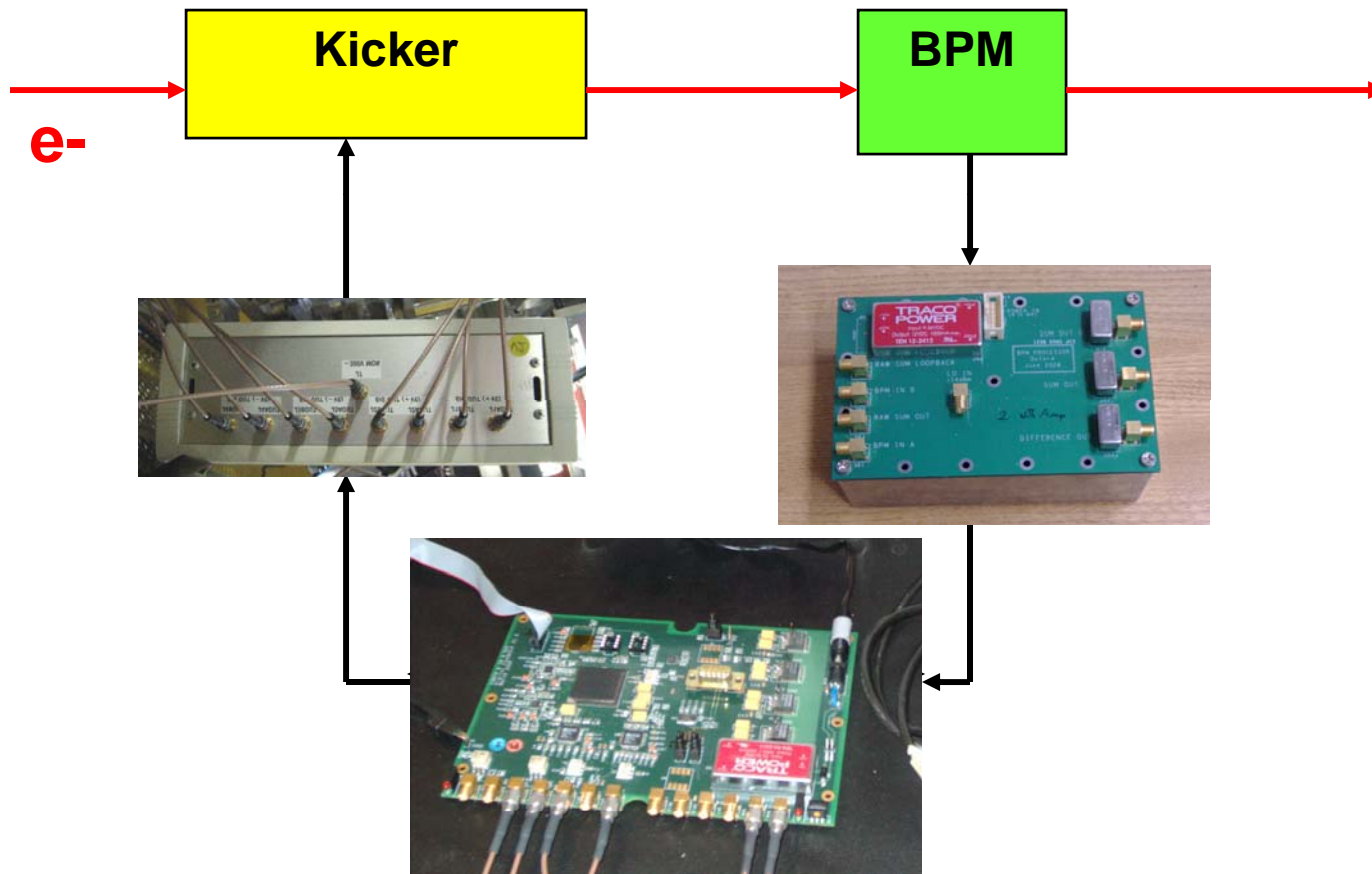


Probably manufacture according to SLAC SLC design

ATF2 FB hardware: electronics

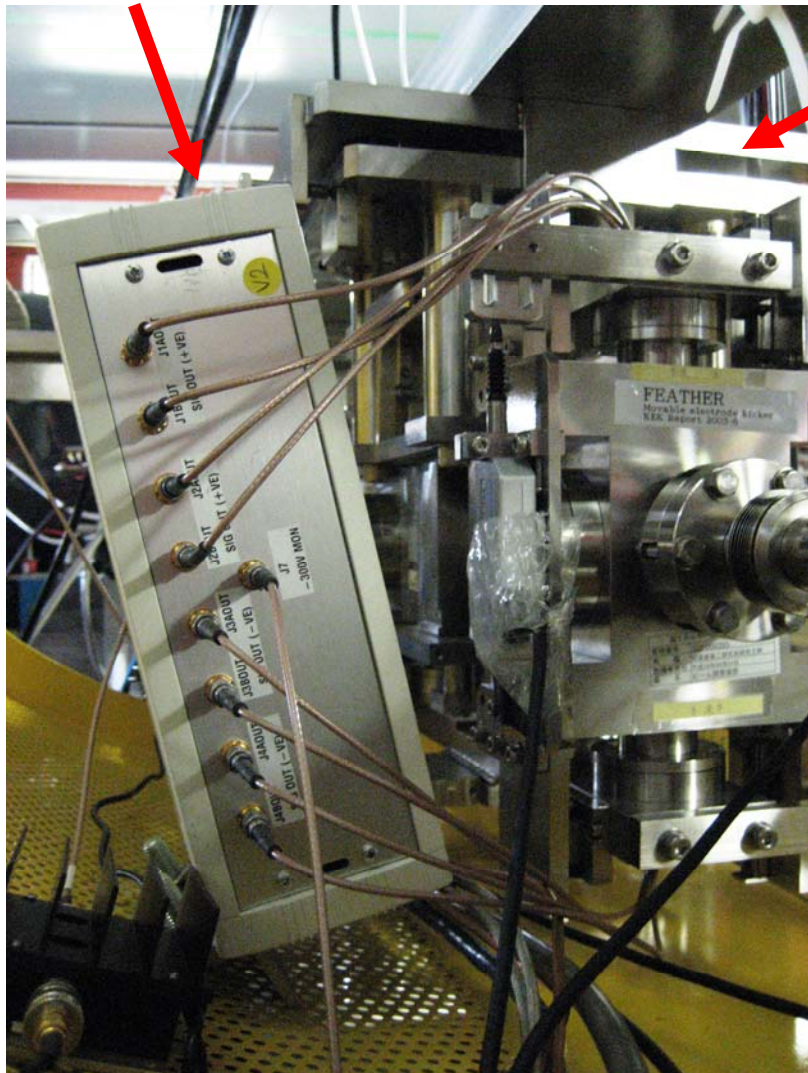


ATF2 FB hardware: electronics

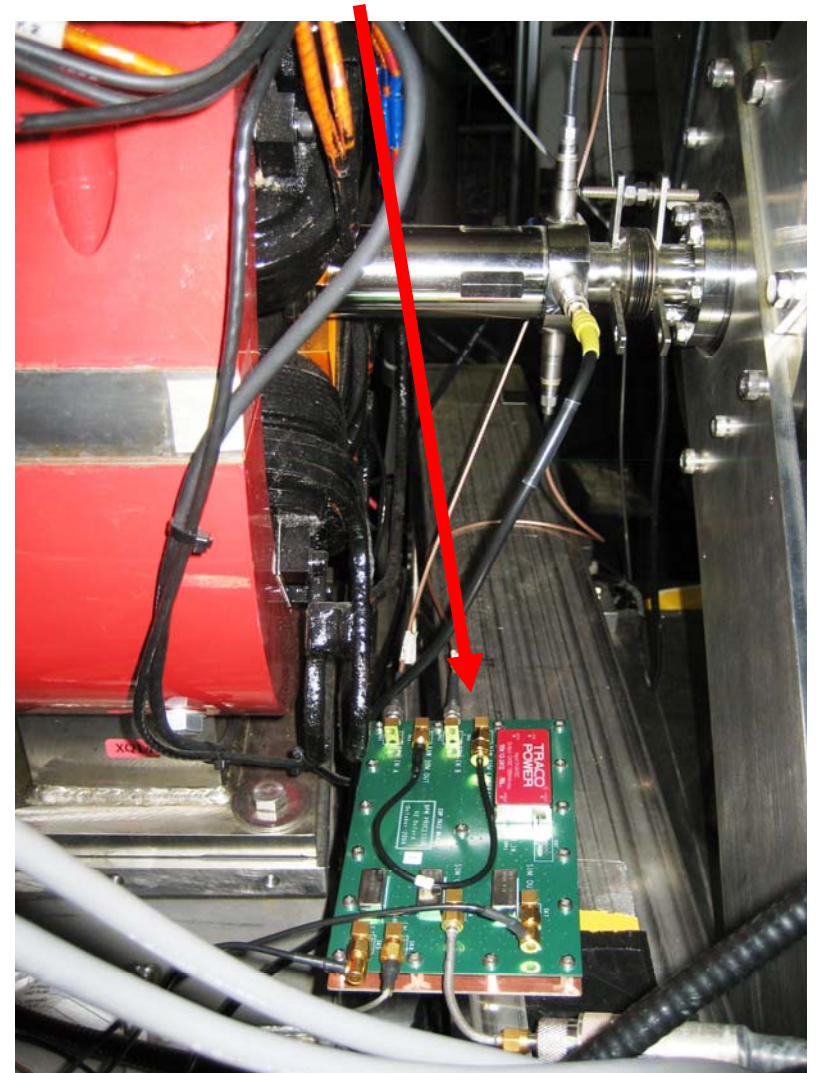


FONT4: beamline at KEK ATF

Amplifier



FEATHER
Kicker



Latency budget

- Time of flight kicker – BPM: 9ns
- Signal return time BPM – kicker: 15ns
- **Irreducible latency: 24ns**

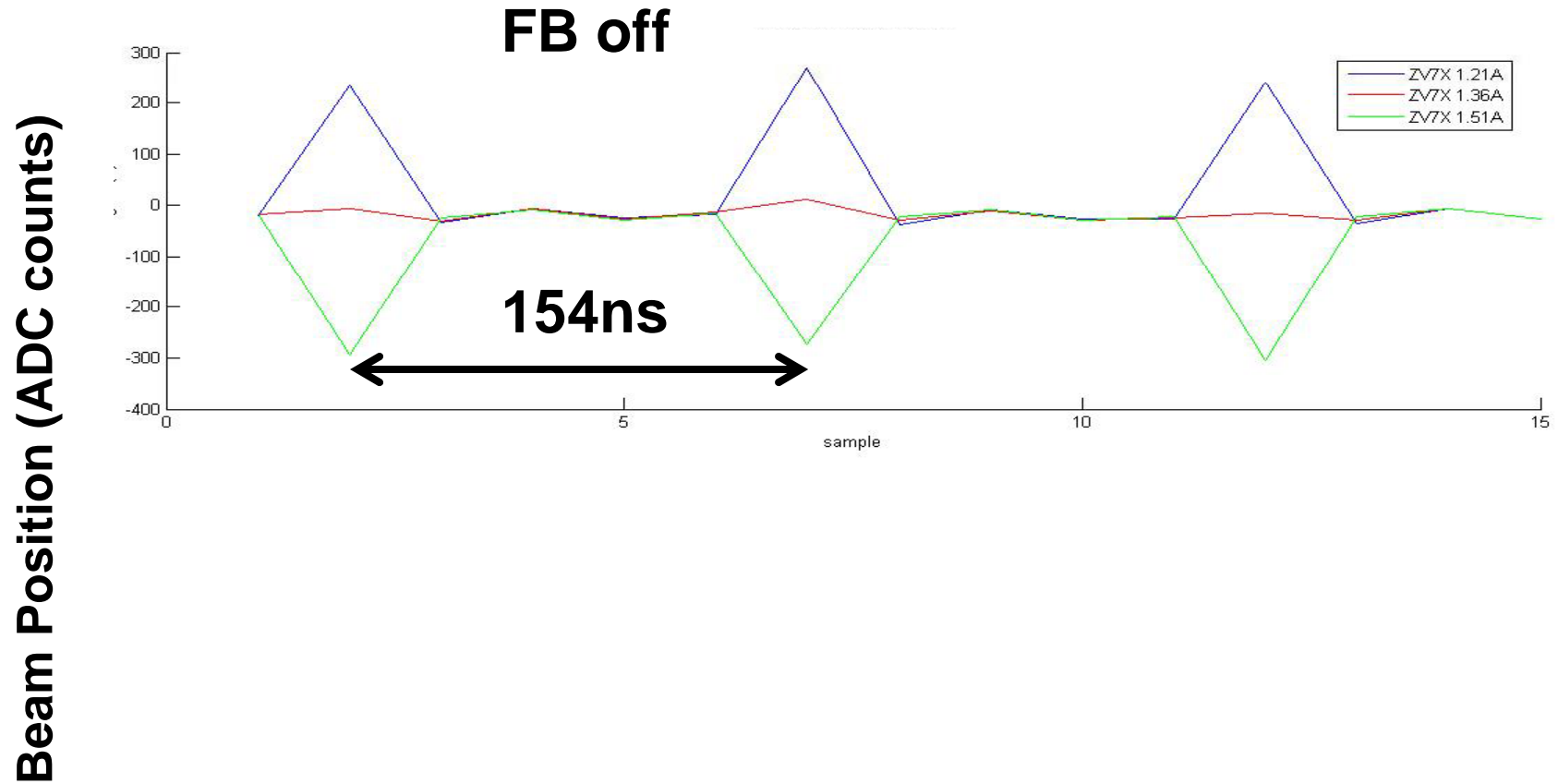
- BPM processor: 7ns
- **ADC/DAC (3.5 89 MHz cycles) 40ns**
- **Signal processing (9 357 MHz cycles) 28ns**
- **FPGA i/o 3ns**
- Amplifier 35ns
- Kicker fill time 3ns
- **Electronics latency: 116ns**

- **Total latency budget: 140ns**

Schedule

- **Beamline hardware ready before October**
- **Can be installed according to ATF2 schedule**
- **May upgrade electronics:**
 - new BPM processors**
 - new FB board based on Xilinx V5 FPGA**
 - more sophisticated FPGA algorithms**

Reminder of FB performance



Reminder of FB performance

