

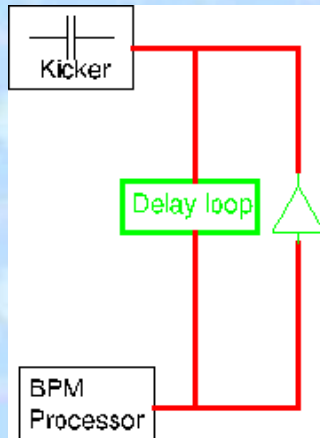
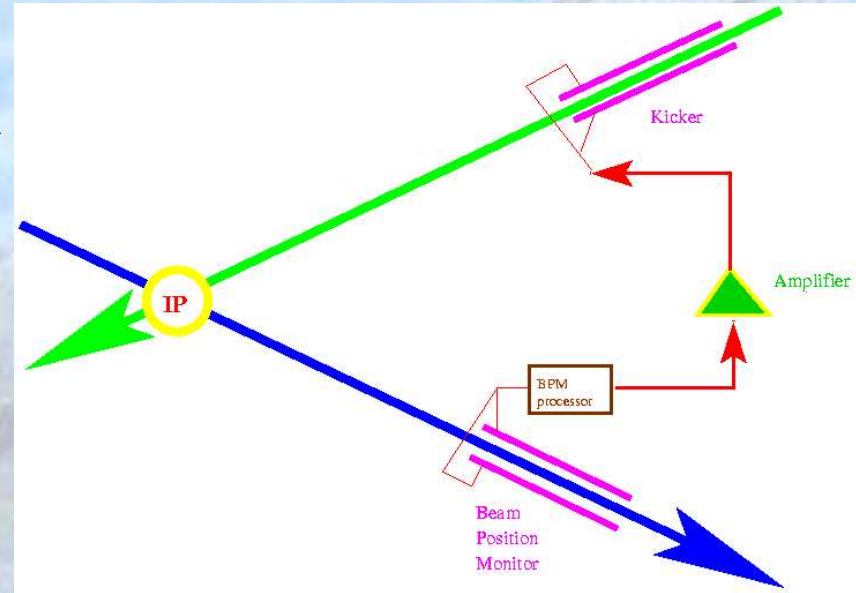
FEATHER: Progress report

- Fast feedback models
- Offline tests
- Beam tests
- Kicker studies & design
- Matlab simulations
- Opto-FEATHER
- FEATHER + Cavity BPM

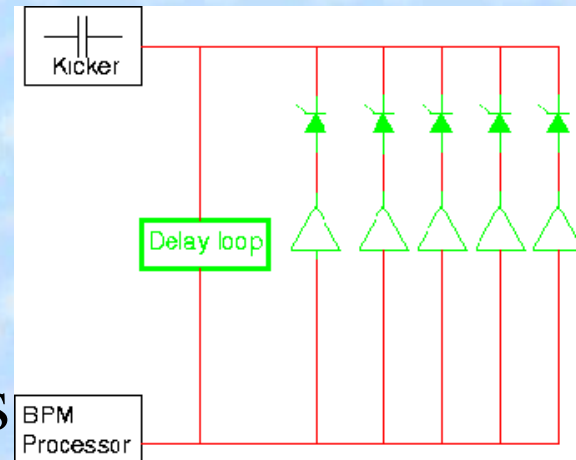
*more details can be found at <http://acfahep.kek.jp/subg/ir/feather/>
or on [arxiv.org: physics/030517](http://arxiv.org/physics/030517)*

The fast feedback models

Simple model:
simple direct feedback



Delayed model:
feedback with a delay loop



Improved model: delayed model
+ diodes to switch between different gains

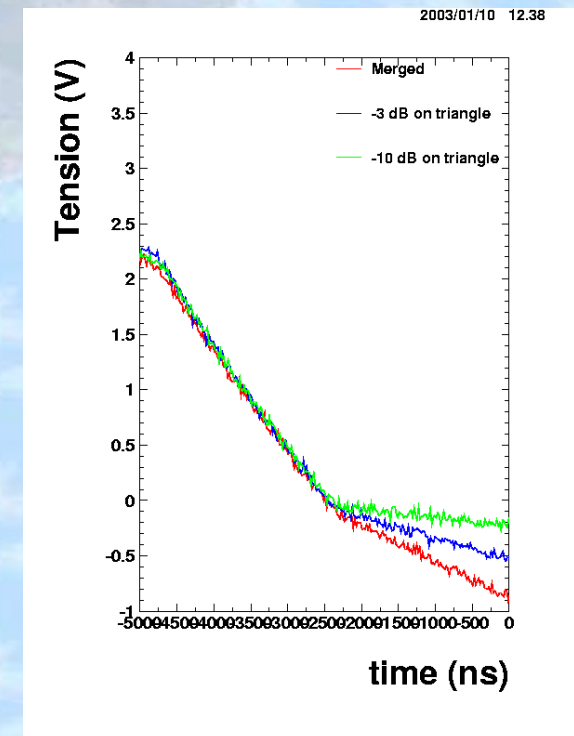
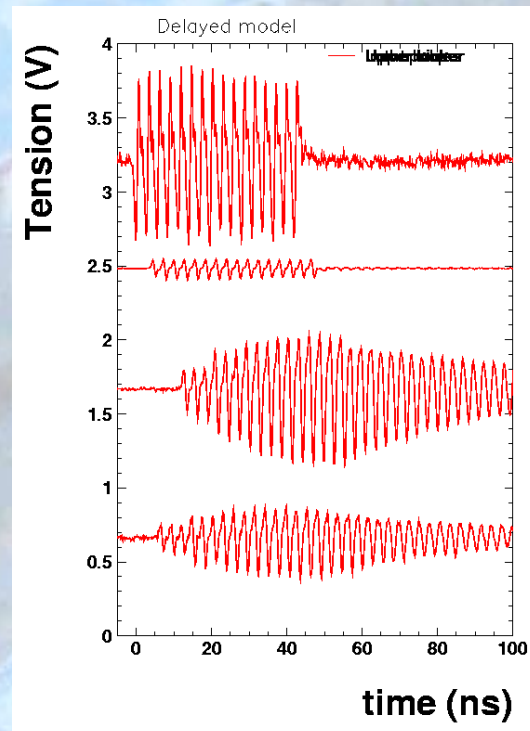
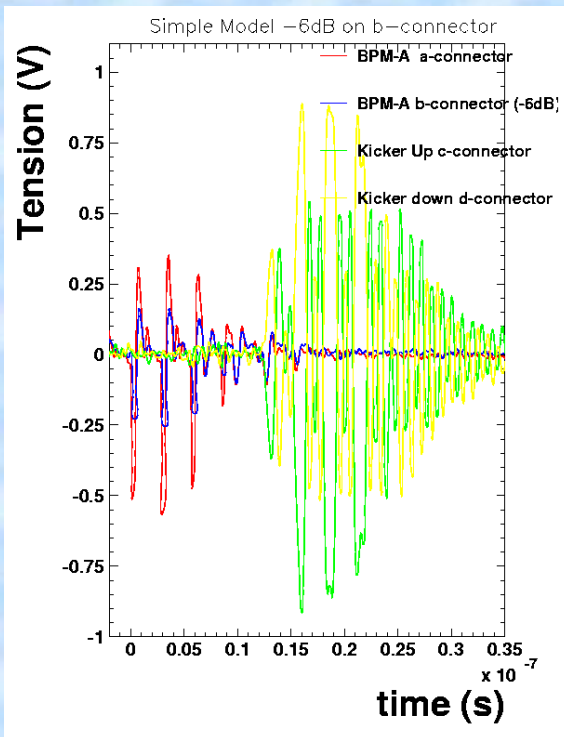
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Offline tests

All models have been
successfully tests offline

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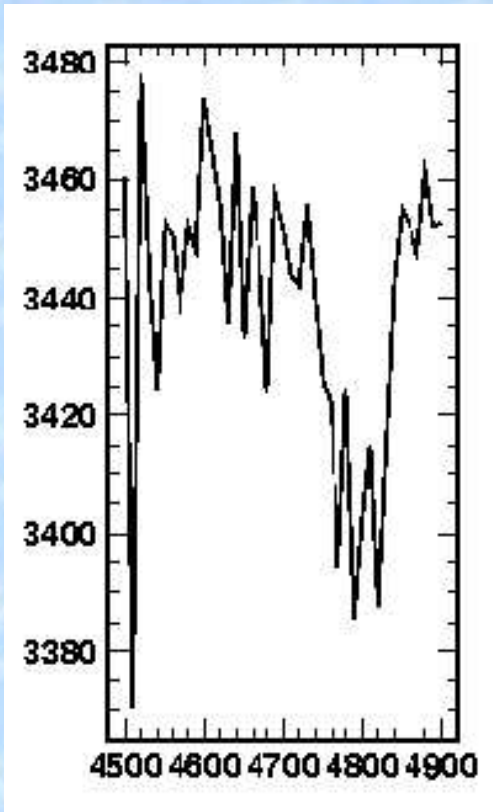


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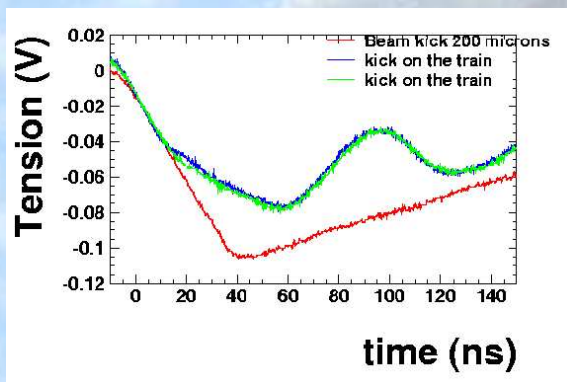
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Beam tests

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Beam pos vs pulse time



- First beam tests were not easy (not enough power to kick the beam)
- New pulse generator (1kW)
=> Effect seen on the beam
- Measurements with cavity BPM have been done
- Software written to discuss with GPIB box + ATF_CONTROL
=> Ready for automated beam tests

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Kicker studies & design

- 3 months have been spent to study various kicker configurations
- An extensive scan of the kicker parameters has been done (more than 1000 simulations)
- Results published as KEK-report (see other talk)
- A design has been proposed:
 - Electrode 6mm wide and 1 mm thick
 - Ceramic support 8x8 mm
- Kicker should be ready in September

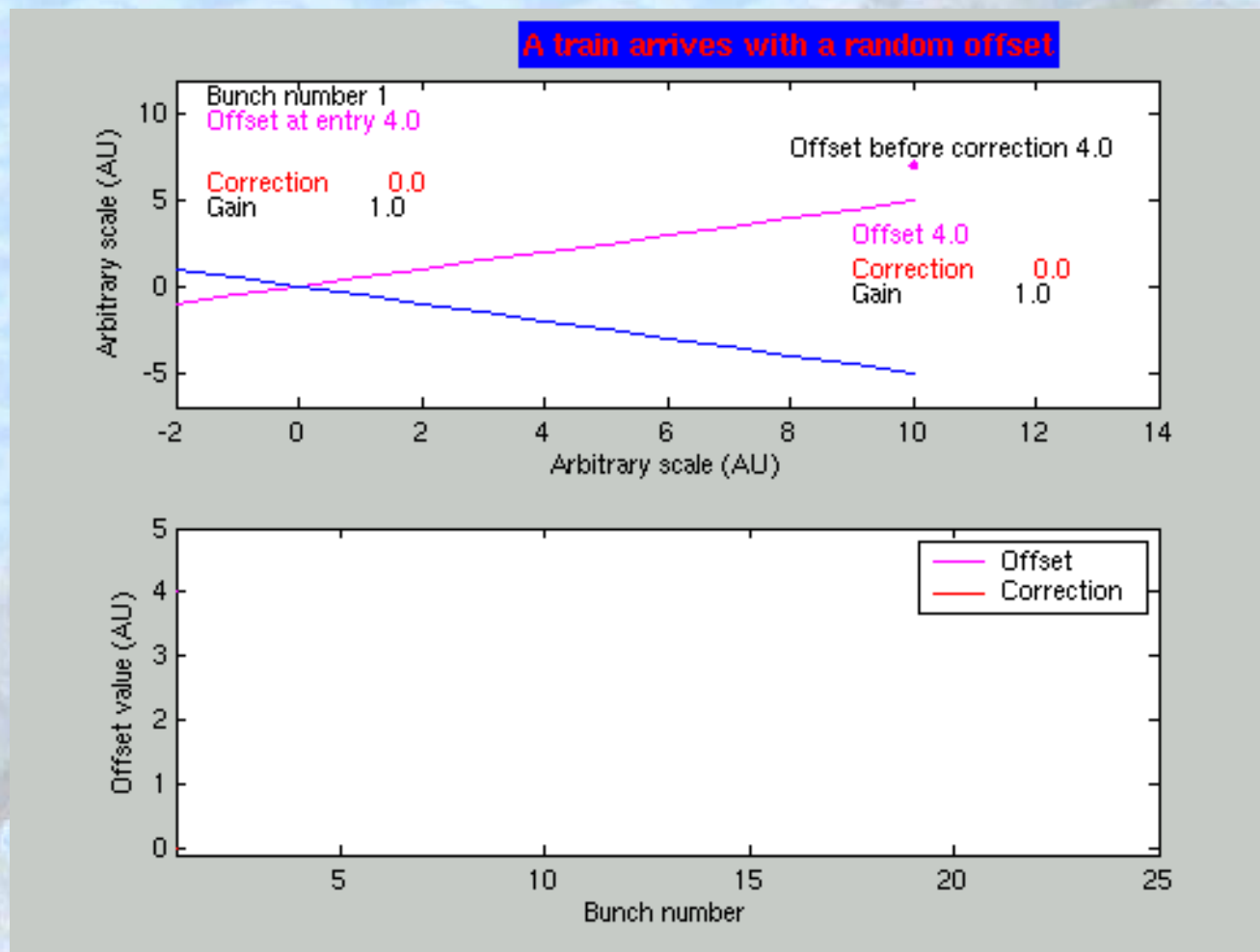
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Matlab simulations (1)

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Perl code simulating the various models has been translated to Matlab. Animations have been produced.



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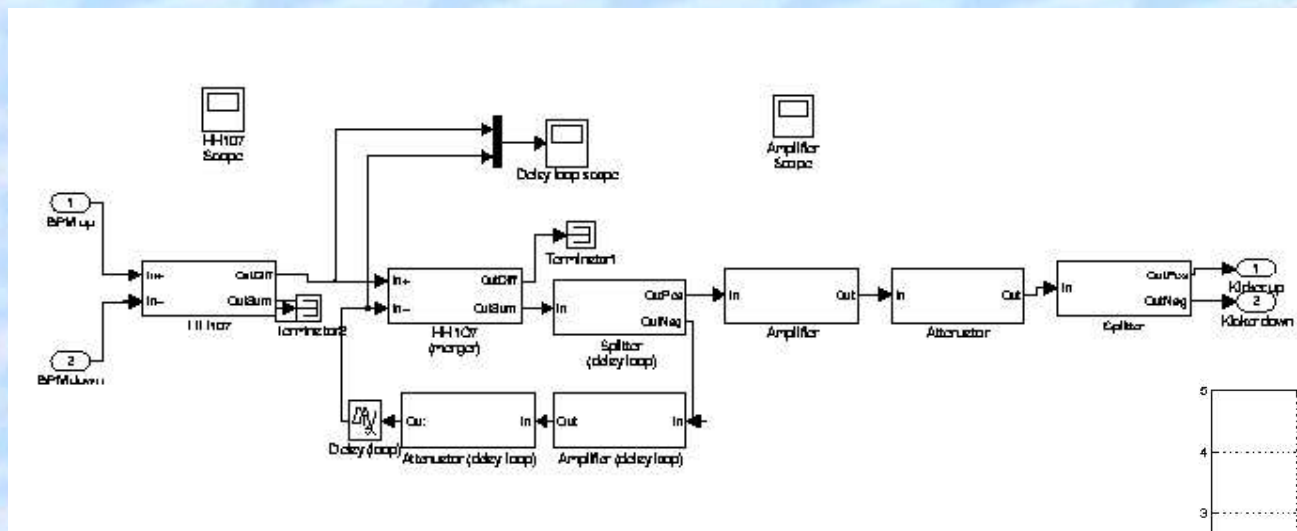
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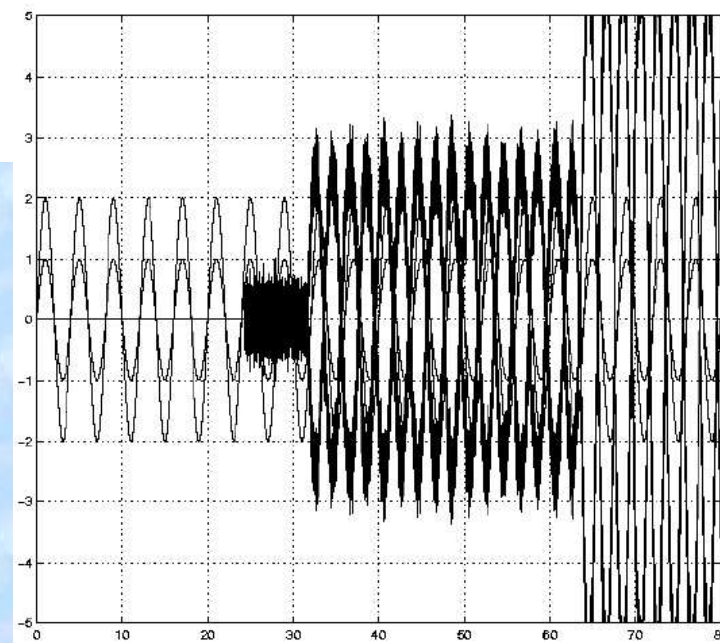
Matlab simulations (2)

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Simulink has been used to simulate the electronics.



Example:
delayed model



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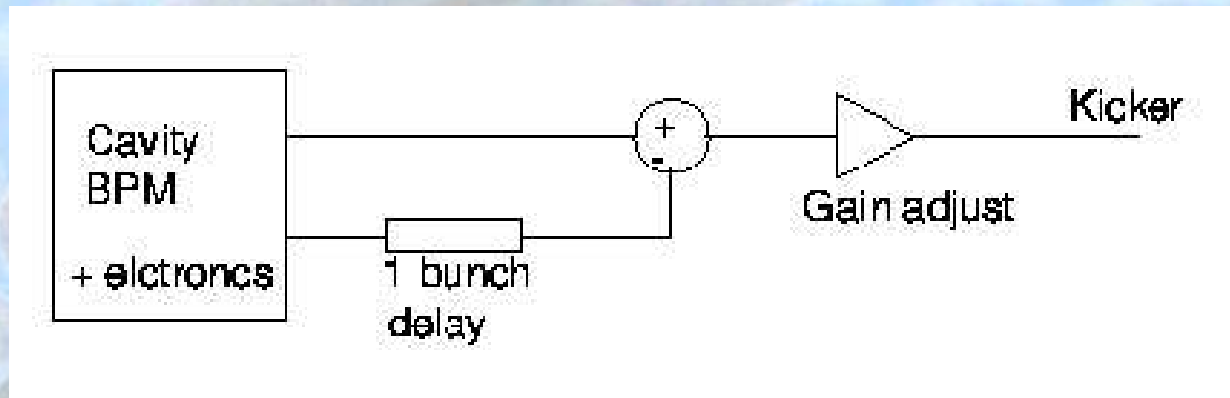
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Opto-FEATHER

- Talks have been held at Tsukuba University to discuss the use of photonic crystals in a fast feedback system.
- Photonic crystals can reproduce most of the RF components behavior
- But they are expensive
- Summary note will be written soon

FEATHER + Cavity BPM

Following beam tests measurement of a cavity BPM's output coupling a cavity BPM with electronics based on the “simple model” could help correcting the beam trajectory.



Conclusions

- Various models of fast feedback have been proposed, simulated and tested on a test-bench.
- Beam test not yet possible due to kicker power requirement
- New kicker has been designed and ordered
- Beam test software has been written & tested
- Alternative solutions have been explored
- **FEATHER tests will be done next autumn**

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