Nanosecond Timescale Intra-bunch-train Feedback for the Linear Collider

FONT prototype at SLAC NLCTA:

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

Linear Collider intra-train feedback concept:

Beam test results:

Signal processing:

Latency 53 ns  14:1 correction

Beam flattener:

Take 'snapshot' of static features of position profile, calculate correction w.r.t. mean position, add into feedback loop.

Technique works

Bandwidth limited (30 MHz) due to kicker amplifier.