

Feedback Strategies for longitudinal Beam Stabilization

Tuesday 18 October 2011 12:30 (20 minutes)

Stabilization of the bunch arrival time and compression is the main goal for the LLRF control system, which can be optimized by using beam information in additional feedback loops. Therefore a beam based feedback strategy is presented, distributing the control into three different time domains.

First a fast intra-train feedback loop acting on a us level during the macro-pulse reducing the arrival-time and compression jitter. This is further supported by a pulse to pulse feedback which minimizes residual control errors from the fast feedback by changes of the set-point trajectory. Finally a slow feedback loop acting in ranges of 1-10s, compensating slow drifts in the machine by modifying the set-point values.

Measurement results will be presented to discuss advantages of different methods. Finally the combination of beam and field feedbacks will be given.

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Session Classification: Session 5