**Abstract.** High resolution beam position monitor (BPM) electronics based on diode peak detectors is being developed for processing signals from BPMs embedded into the future LHC collimators. Its prototypes were measured in a laboratory as well as with beam signals from the collimator BPM installed on the SPS and LHC BPMs. Results from these measurements are presented and discussed.

Diagram of the compensated diode detector

The compensated diode detector consists of two peak detectors, one with single, and second with double fast Schottky diode, integrated into one package for good symmetry of the forward voltages and thermal coupling. The difference of the output voltages from both peak detectors $V_d$ is fed into an operational amplifier $OA_1$. The current $I_d$ passing the second peak detector $D_2$ is converted into a voltage $V_d$ by the resistor $R_{oa1}$. This voltage is converted back into current $I_d = V_d / R_{oa2}$, which in turn is converted back into voltage $V_d$ with feedback $R_{oa1} = R_{oa2}$. In this way $2V_d$ is added to the output of $OA_2$, compensating $2V_d$ drop on the two diodes $D_2a$, $D_2b$ and the output voltage $V_o$ is equal to the input voltage $V_i$.

Diode ORbit (DOR) Measurement

One plane of the DOR measurement system consists of two symmetrical channels converting fast beam signals from the opposing electrodes of a position pick-up into slowly varying DC signals. The multiplexer is foreseen for cross-calibration of each channel pair.

Measurements

- **Lab measurements of the long term stability, raw ADC signals.** 10 MHz sine wave is connected to all 4 system channels.
- **Drift of the raw signals shown in the left adjacent plot together with the variation of the front end box internal temperature.**
- **Projected beam positions assuming a pick-up with 49 mm electrode distance, like in the LHC arc pick-ups.** Drift of the projected positions shown in the adjacent left plot; no temperature compensation, no calibration used.
- **Lab linearity measurements with simulated centred beam, raw ADC signals.** Input: 10 MHz sine wave with ramped amplitude.
- **Differences of the signals shown in the left adjacent plot for raw signals and signals calibrated using correlation coefficients.**
- **Projected beam positions assuming a 49 mm aperture pick-up, shown for both, raw and calibrated signals.**

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