

# Online Phase Space Tomography of fast compressed bunch using new fast current transformer signal

**Koordinator:** O. Chorniy

**Participants:** P. Huelsmann, O. Boine-Frankenheim,  
H. Reeg.

**Beam time:** from 16:00 till 22:00, March 11, 2010

March 18, 2010.

## 1. Goals of the measurements.

The plan for the beam time includes several general topics which have an important interceptions in future SIS18 operation:

- a) Check the operation of the new fast current broadband transformer.
- b) Online Phase Space Tomography.
- c) Bunch compression at extraction energy.

## 2. Preparations.

The following preparations were done:

- a) To measure the broadband transformer signal, the LeCroy oscilloscope was installed in the Electronic Room.
- b) To measure the "old" phase detector signal, the second LeCroy oscilloscope which is built-in in Control Room was set to measure the signal in the same time range as first oscilloscope. This was done for later qualitative comparison of both broadband transformer and phase detector signals.
- c) A user interface for online tomography was created.

## 3. Measurements. (16:30-21:45)

Ion:  $\text{Ur}^{+73}$

Intensity: 5-10e8 ions/cycle

Compression energy: 295MeV/u

RF harmonic: 1

Pre-bunching RF voltage amplitude: 1, 2, 4, 8, 16 kV

Bunch compressor voltage amplitude: 38, 20 kV

The measurements of the longitudinal beam profile were done using signals from broadband transformer and phase detector. Longitudinal beam profiles were measured at different RF voltage amplitudes and different LeCroy settings. Bunch compressor was on during one synchrotron period and afterwards kicker for fast extraction was on.

**Remark:** The bunches were strongly distorted after the **RF capture** at compression energy, most probably due to mismatch (in SISMODI) between RF frequency and beam energy.