

## Draft minutes of the 13. CTF3 Committee meeting held on 20.8.2009

Participants:

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All transparencies can be found here: <http://indico.cern.ch/conferenceDisplay.py?confId=66174>

1. The minutes were approved without comments.

2. CTF3 operations and schedule

Roberto reported on the operation of CTF3 since the last meeting 2 months ago.

A combination factor of four has been achieved with the Combiner Ring with reasonably flat pulses. The combined current achieved is now routinely 12 A, with a maximum of 14 A. About 6A peak current have been sent through the PETS, giving 80 MW of output power with recirculation. However, this should be more, problems are suspected in the variable attenuator in the recirculation circuit.

There are problems with the beam position monitors in TL2 and in CLEX, the system needs to be debugged in collaboration between LAPP and CERN. Only about ½ of the pick-ups are working, which makes any optics optimisations impossible and we have to accept substantial beam loss in the lines.

Spurious phase jumps of klystron MKS2 which made operation difficult for a while, have disappeared again. In spite of substantial diagnostics work, we were not able to track down the source of the problem.

The electron gun is quite stable in the moment since the last intervention, where the oxidized contacts on the cathode assembly had been cleaned and several broken fans in the high voltage deck were replaced.

The droop compensation of the beam current from the gun works again, however, has little effect. In the future a dedicated system has to be developed to stabilize the beam current.

Roberto recalled the goals for 2009 (see the transparencies) some of which are on track, others are still pending. In general we are about one month behind our initial plan. There is good hope to get the Delay Loop and the Combiner Ring operating simultaneously before the CLIC workshop.

The TBL has seen beam, but only 4 A so far, which gave 3 MW of 12 GHz RF power, as expected. For full validation 20 A are needed, but 10A are already interesting.

The immediate programme for next week foresees to focus on TBTS, with one day for TBL.

CLEX will be opened for installation work from 21. September for three weeks, with the fourth week, where the CLIC workshop takes place, as reserve. Operation of the rest of the machine up to the tail-clipper/dump will go on during this time. It is foreseen to complete TBL with all quadrupoles incl. movers and beam position monitors. The missing PETS tanks will be replaced by temporary vacuum chambers, so it will be possible to debug the whole line with beam to the end. As PETS tanks arrive, they can easily be installed. In addition, an accelerating structure will be installed in the probe beam line of TBTS. This, however, requires, that the optics of this whole line is evaluated before, since the accelerating structure presents a severe aperture restriction.

3. TBTS

Roger reported the latest TBTS results. The PETS has been conditioned up to 80 MW with an average current over the pulse of 5A, data are systematically logged. Problems are suspected with the variable attenuator in the recirculation line, preliminary measurements with the piezo receivers also point in this direction. However, this needs to be confirmed.

The Uppsala team has – together with CERN laser and klystron experts - got CALIFES back into operation and beam has been sent to the end of TBTS.

The programme for the immediate future is focused on PETS conditioning and commissioning of both beam lines. Roger pointed out, that some effort is required to synchronize Probe and Drive Beam to demonstrate two-beam acceleration. No light has been observed yet with the camera looking into the PETS tank, but a large increase in the noise level was visible with each beam pulse

The “Ubi Display” which gives a schematic view which parts of the machine have beam, is working now. The possibility to have beam running over night was asked, this requires supervision from the CCC and needs further discussions.

#### 4. BPS status

A.Faus-Golfe could not participate, but she had sent a mail with details of the beam position monitors. In summary, all beam position monitors will be at CERN in time for installation. The supports have already been delivered.

#### 5. Beam loss instrumentation

Carsten Welsch (University of Liverpool / Cockcroft Institute) gave an overview about the work going on for CLIC/CTF3 in the frame of the Quasar group. The main focus for us lies in beam halo monitoring and beam loss measurements.

A new development in the area of halo measurements is the use of a CID camera, which has the potential to reach a dynamic range for  $10^7$  without any masks. It should be noted, that the required dynamic range is only  $10^4$  from beam dynamic considerations. A disadvantage of this system is the long acquisition time of typically tens of min.

Another technique is to use micro mirror arrays to mask the core selectively using the mirrors. A dynamic range of  $10^{5.5}$  has already been achieved.

Both systems are close to testing with beam, tests are planned at University Maryland.

Another method which is being developed, is the use of a gas jet curtain for bench-marking of the techniques.

One of the difficulties of beam loss monitoring in CTF3 is the presence of two beams close to each other. Carsten proposes a system of four optical fibres running parallel to the beams which exploit Cerenkov radiation, based on work at DESY. The goal is to achieve a loss detection on the level of  $10^{-4}$ . A spacial resolution of 1cm should be achievable. Theoretical studies of signal generation in the fibres are advancing, experiments are planned in the future.

The possibility of an experimental programme at CTF3 needs to be further investigated.

25.8.2009 G.Geschonke