

Minutes of the SPL steering group

meeting no. 12

date: 1 August 2008

present: O. Brunner, R. Garoby, F. Gerigk, A. Lombardi, J. Tuckmantel, W. Weingarten

Agenda

1. General news and facts
2. Budget for CERN SRF work (W. Weingarten)
3. understanding of cryogenics (W. Weingarten)
4. $Q(T, f, B_{\text{peak}})$ (W. Weingarten)
5. Next meeting

1. General news and facts

- RG reported on the recent cuts in EUCARD: It is clear that the SRF test infrastructure is now out of the proposal. However, it was suggested that this should be a high-priority item for FP8. There it is clear that a new 704 MHz klystron has to be part of the installations. Concerning the production of cavities at Saclay, S. Chel has changed the phrasing so that he only guarantees the construction of one $b=1$ and one $b=0.65$ cavity. During a phone conversation he was positive, however, that he would manage to produce 2 $b=1$ cavities.
- In any case our goal has to be to equip a full cryo-module, and we will try by all means to get there, even if the funding is clear yet.
- During a discussion at EPAC'08 Triumf expressed again interest to build 704 MHz, to be clarified during Linac'08.
- We were contacted by ESS-Bilbao to discuss possible collaboration items. A first meeting will take place probably on September, 10th at CERN. In a recent EPAC paper [\[1\]](#) they presented a new possible layout of the ESS, which is based on the Linac4 front-end using 352.2 MHz. They intend to built a front-end test stand within the next years.
- This morning a single-cell cavity (704 MHz) arrived from Saclay. The cavity will be used at CERN to experiment with surface treatment techniques.
- O. Brunner reported on a recent meeting with CPI on klystron needs for Linac4 and SPL. They stated that the Linac4 specs are no problem and that it would be a safe design without particular risks (352 MHz, 2.6 MW, 1.5 - 2 ms, 50 Hz). For the SPL they said that a single beam klystron at 704 MHz, 50 Hz, 10% duty cycle, 5 MW is at the limit of the technically feasible, which is consistent with information from Thales. On the other hand it should be safe to use a multi-beam klystron for these specs. With that one probably reduce the voltage down to 60 kV, which would mean that we don't need an oil tank and that the modulator can be simplified. For 1400 MHz, even for a multi-beam approach they said that 5 MW would be quite a challenge and that we would have to expect limitations due to the high average power density.
- FG suggested that the complete review paper could be submitted to PRSTAB as a more complete version of the HB'08 workshop paper. The workshop organisers encourage the participants to do this and they want to set up a special edition in PRSTAB for the workshop. It was agreed that we will aim for this.

2. Budget for CERN SRF work (W. Weingarten)

W. Weingarten is preparing the budget numbers and spending profile for SRF work at CERN including HIE Isolde and SPL. A first draft is available here.

3. understanding cryogenics (W. Weingarten)

WW went through U. Wagners notes that were used for the cryo-estimates in the 2006 SPL design report. He re-calculated some of the simplified formulas and made a short write-up with the help of U. Wagner.

4. $Q(T, f, B_{peak})$ (W.W.)

WW reviewed a pile of available data on test results at different frequencies in different labs. The result is an approximative formula for the dependance of Q on the cavity fields. The curves for cryogenic power consumption now show a similar installed cooling capacity for both frequencies, even with a small advantage for 704 MHz. FG used this formula as the basis to calculate the cryogenic loads for the 704 and 1408 MHz scenarios and has included the numbers in the draft of the review report. Another important quantity comes out of this formula: the difference in Q at 704 MHz, when going from 2 to 4.5 K, which amounts to 45 (!!). This value is consistent with the formula, which was proposed earlier by S. Calatroni. With that it is clear that operation at 4.5 K is out of the question!

5. Next meeting

19 September, 16:00 in 866-1-D15

next general SPL meeting September, 10th 2008, 9:00 in 6-2-004

6. Comments

-- FrankGerigk - 01 Aug 2008

- Time_profile.pdf
- Cryogenic_formulas.pdf
- SPL_steering_group_Aug08.pdf: SPL_steering_group_Aug08.pdf

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