

Collimator Design Meetings

Minutes of the meeting 55 (20/01/2005)

Present: Aberle, Assmann, Bertarelli, Calatroni, Hänni, Kadi, Mayer, Perret, Principe

Minutes # 54: no remarks were given

REPORT FROM THE VISIT TO CERCA

1. Oliver reported about the visit to CERCA which took place end of week 2 (Oliver, Ralph, Enrico)
2. Planning and production rate required by CERN have been presented to CERCA and are currently under firm's study.
3. CERCA gave its principle accord on a production strategy which foresees test prototypes of critical components (i.e. assembled blocs + open tank) by end of July 2005. In order to do so, material must be delivered to CERCA by end of June and must be at CERN premises by end of May at the latest. First 4 preseries collimators shall be delivered by November 2005 and regular production be on its way by February 2006.
4. CERCA reserved to give a definitive answer by end of February 2005. By that date the series production drawings for TCP and TCSG shall be ready as long as the dossiers for TCT(a), TCLP/A and TCDI.
5. Relevant documents to issue the call for tender for the these collimator variants and for supports shall be issued by end of March in order to face the Finance Committee in June 2005

STATUS OF COMPONENT ORDERS

1. DAI for C/C, Glidcop (extrusions + tools), Roller screws have been issued by Alessandro and Manfred and are following the approval procedure. Glidcop has been inserted in CERN store material and ordered with a SCEM number.
2. Oliver shall prepare a status list of component orders.,

DECISIONS ON ELECTRONIC COMPONENTS

1. Roberto was absent but gave by e-mail the following report (excerpts from e-mail dated 19/01/05):
 - a. Motors: Size Nema 34, shaft 10 mm, lenght min 105, max 140 mm
 - b. Resolvers: it was not possible to test any for the moment. I will check with Roger tomorrow morning what to do.
 - c. Position sensors: as above.
 - d. For the Electrical plug-in a supplier able to do that has been found. The price enquiry is in preparation. Roger has all the information.
 - e. For radiation levels, please look at the e-mail attached from Vasilis Vlachloudis (V.V. "Katerina Tsoulou has scored the dose around the following secondary collimators: first secondary TCSG.A6R7.B2, the one that sees the higher dose (see [TCSGA6](#)), which is of the order of MGy/y, while the second secondary TCSG.A5R7.B2 (see [TCSGA5](#)) is significantly lower")
2. As an outcome of the meeting between Roger and Roberto, Roger informed that:
 - a. Position sensors: The final choice of position sensors is still far from being done. This makes very problematic the definition of the integrated sensor / switch cam support. The possibility to hold up the production of these components shall be studied.
 - b. Electrical feedthroughs: According to Roberto the two long wires of present design might act as noise pick-ups (antenna effect). He suggest to twist them. This would heavily change the present design. Alessandro reminds that in order to receive the material within the schedule an order should be issued a.s.a.p. A final decision shall be taken within 1 week (action Roberto / Oliver)
3. Temperature probes: a study on the issue based on the design proposed by Roger is currently being run by Oliver. A final decision shall be taken within 2 weeks (action Oliver)

4. It is recommended that an AB internal meeting (Oliver, Roberto, Ralph, ...) be held in some days in order to clarify all the pending issues and give clear inputs for the finalization of mechanical design.

RF CONTACT TEST BENCH

1. The test bench has been assembled and first tests carried out. The solution tested is CuBe fingers fixed onto C/C and sliding onto steel flanges. The results seem quite promising since the measured impedance is in the range of $2m\Omega$ on both contact ends (target is $1m\Omega$ overall). Details can be found in [RFContactImpedance](#)
2. In next days steel flanges will be Rhodium coated in order to improve electrical behavior (possible wear problems?).

WATER CONNECTIONS

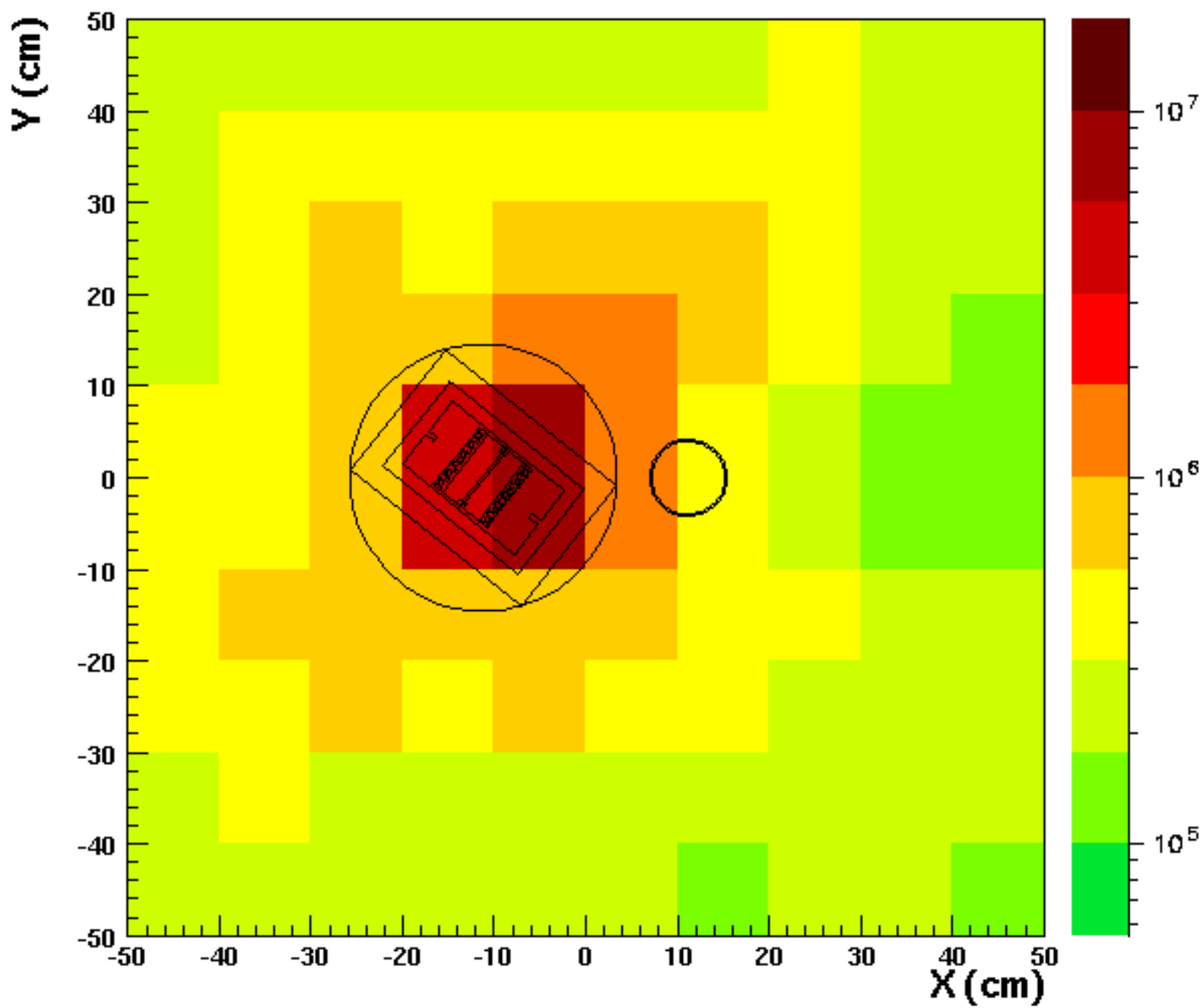
1. A meeting was held on the 19/01/05 between Roger, Alessandro and Manfred and Ph. Pigné (TS/CV). All the available information was given to Philippe, who is studying the water connection system. Rosario acknowledged the given information and reminded that the cooling system must be compatible with the new proposed ventilation system (implying that water pipes shall run on the top of the vault).
2. It was reminded that the water equipment must sustain a radiation dose which is in the range of 10 MGy ($\sim 0.7MGy/year$ – see for instance [TCSGA6](#))
3. Rosario stressed the fact that the cooling water is the same used for all the other equipments in the insertions must be confirmed! Such a confirmation must be given by Ralph on the basis of SC/RP data (**action** Ralph).
4. Manfred presented a chart showing that the given levels of radiation should allow for the use of water quick connection even with plastic seals.

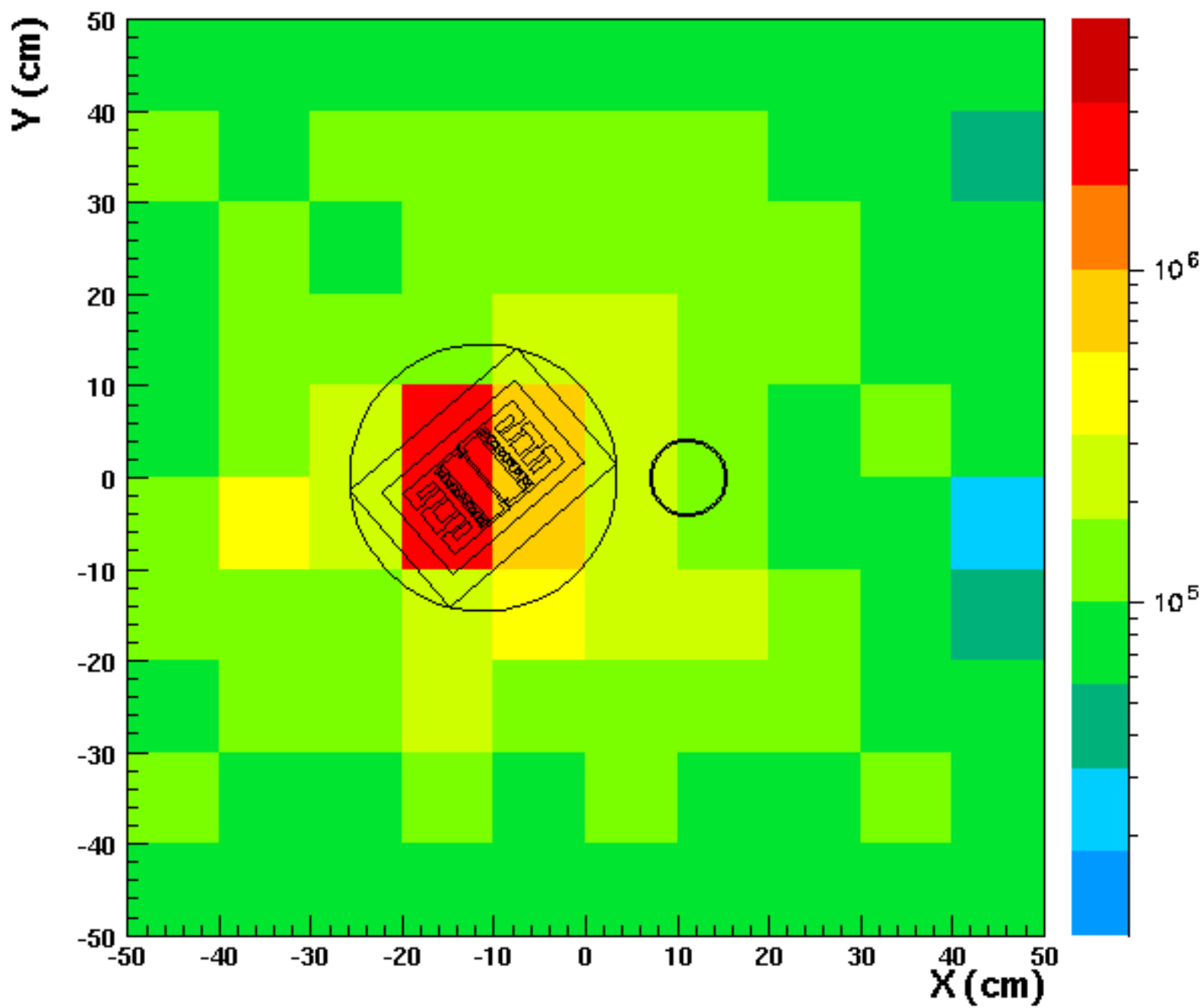
AOB

1. Raymond informed that he received the offers for TCDI graphite.
2. Alessandro stressed the fact that in the order of C/C the required minimum transverse thermal conductivity shall be specified (i.e. 70-80 W/m/K - equal or higher to received samples) (**action** Manfred).
3. Roger presented a study of the installation and handling of collimators (see [T0082103PL](#)). The drawing has been already passed on to Keith Kershaw.

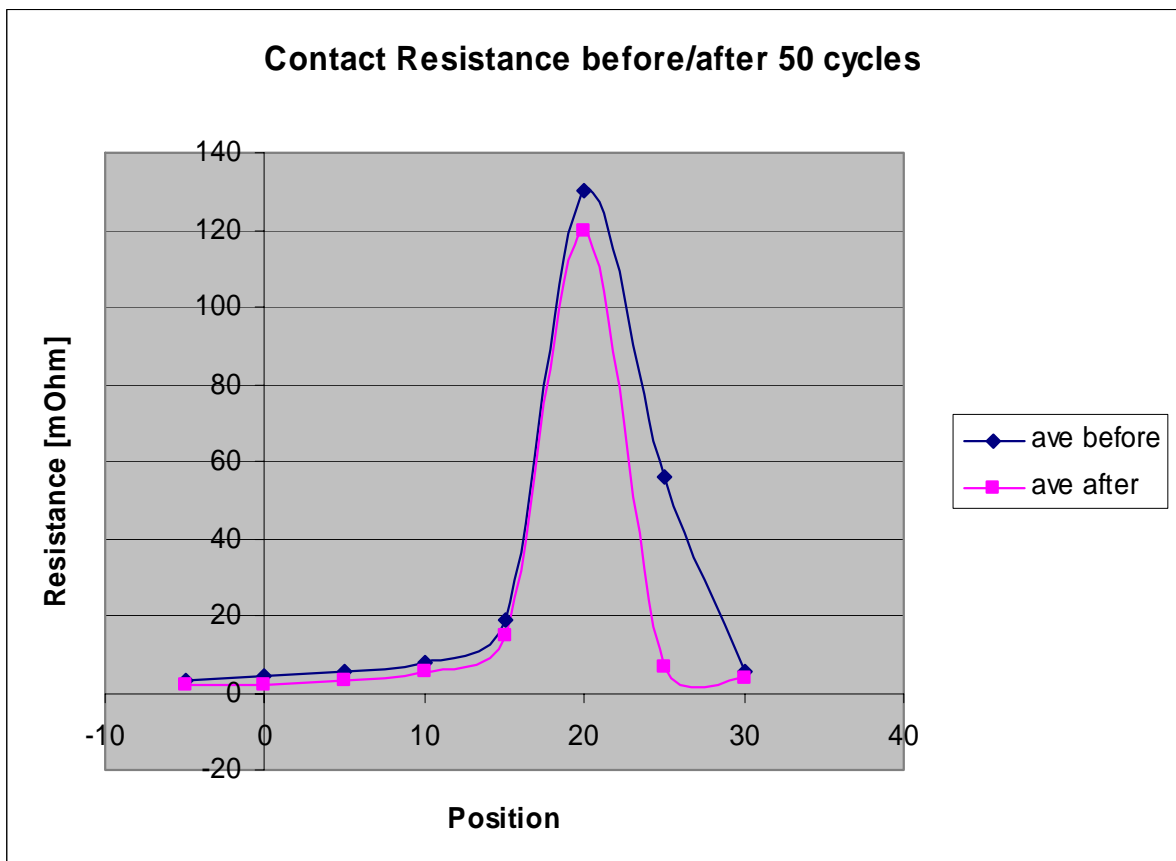
ACTION LIST to be followed up:

Play between motor spindle and jaw	#34	Roger
Non-symmetric heating of vacuum flanges	#34	Vasilis, Oliver, Miguel, Rathjen
Radiation issues – heat evacuation, air duct, space, shielding		Ralph
Detailed information on electrical plug-in and sensors (URGENT)	#45	Roberto
Detailed information on water plug-in (URGENT)	#45	Manfred
New Fluka simulation for 7TeV accident case	#47	Vasilis
Updated calculation on beam optics during transient	#49	Ralph
Acceptable RF design by RF people	#50	Ralph
Radiation dose on electrical components (URGENT)	#50	Vasilis, Roberto





- Required global contact resistance: 1 m Ω
- First test: contact fixed with screws on C-C block (M3 threaded holes)
- CuBe fingers with 5 μm Ag plating
- S.steel centring rings, inner and outer flat (outer ring exists also with guides for fingers)
- Measurements in air
- R (C-C \rightarrow CuBe): 2 m Ω
- R (CuBe \rightarrow S.steel): variable, min 2 m Ω





- Next steps:
- Rh plating of s.steel centring rings (after some more machining)
 - This should improve contact resistance
- CuBe fingers: to plate or not to plate (with Ag)? → problem of wear
- Several new designs & idea for shape of fingers (zig-zag), centring rings (with rounded corner) and of fixation CuBe-graphite to design/build/test

