**Von:** Syresin Eugeniy [mailto:syresin@nusun.jinr.ru]
**Gesendet:** Montag, 12. März 2012 09:03
**An:** Sinn, Harald; Trapp, Antje; Gruenert, Jan; Yurkov, Mikhail; shabunov; FWD\_DL\_FWD\_obrovko\_2009\_11\_04\_13\_42\_04\_0
**Betreff:** Fwd: Re: Conceptual Design MCP-based detector

Dear Harald and Antje!
Excuse my silence I was ill several days.
I would like to return to discussion about preparation of common AutoCAD drawing of Second mirror chamber, MCP chamber and vacuum pipe after MCP chamber. I assume that MCP chamber will be placed on a distance of 1.75 m from middle of second mirror.
We are ready to send you any 3 D files of our MCP chamber or are ready to work with your 3D files. Please, to inform us about possible collaboration in the direction to joint both chamber drawings in one XFEL system to fix final geometry.
Best regards, Evgeny

-------- Исходное сообщение --------

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| --- | --- |
| **Тема:**  | Re: Conceptual Design MCP-based detector |
| **Дата:**  | Mon, 5 Mar 2012 16:55:46 +0400 |
| **От:**  | Alexey Shabunov <shabunov@jinr.ru> |
| **Организация:**  | Internatonal Intergovermental Organization Joint Institute for Nuclear Research |
| **Кому:**  | Syresin Eugeniy <syresin@nusun.jinr.ru> |

Картинка с переходниками

----- Original Message -----

**From:** Syresin Eugeniy

**To:** Sinn, Harald ; antje.trapp@xfel.eu ; shabunov ; oleg brovko ; Gruenert, Jan ; Yurkov, Mikhail

**Sent:** Friday, March 02, 2012 5:25 PM

**Subject:** Re: Conceptual Design MCP-based detector

Dear Harald and Anje!
1. Thanks you for your letter and your additional information.
2. As I understand from Anje letter that the horizontal offset of second mirror chamber axis corresponds to 53.39 mm relatively to direct beam axis.

3. The second mirror chamber will be connected with MCP chamber with some intermediate beam transport chamber at a diameter of 160 mm. I assume that offset of this beam transport chamber axis relatively to direct beam axis also will be 53.39 mm. (Please, to confirm this information to me or send offset value of this chamber axis).

4. We can connect the DN160 flange of this chamber with some bellow section applied for DN200 flange of MCP chamber (see Attachment file). For us important to reduce as much as possible the horizontal offset of MCP vacuum chamber relatively to direct beam (in our initial design it is zero). We propose to reduce the offset of MCP vacuum chamber on maximal possible value 20 mm. In this case horizontal offset of MCP vacuum chamber will corresponds to 33.39 mm.

5. At the presence of MCP vacuum chamber horizontal offset of 33.39 mm for us is very important to conserve entrance flange  position of MCP bellow section (see Attachment file) on a proposed by you distance of 1.75 m behind of the center of 2nd mirror (Please to confirm me that this distance can be fixed for SASE 1 and SASE 2).
At this position of MCP bellow section the distance from center of second mirror before first two small MCPs will be about 2 m and for MCP imager 2.5 m (and third small MCP).
At the maximum deflection angle on second mirror 31.5 mrad the horizontal offset of the reflected  photon spot on MCP  corresponds to -31 mm (right to axis of direct beam) for small MCP and -55 mm (right to axis of direct beam) for MCP imager. At beam reflection from only first mirror the horizontal offset of beam on small MCP corresponds to +96 mm (left to axis of direct beam) and +99 mm for MCP imager.

So, horizontal offset of MCP vacuum chamber of 33.39 mm relatively to direct beam axis is acceptable for MCP chamber, placed on a distance of 1.75 m (or short) from center of second mirror. At an increase of this distance we will loose photon beam reflected from second mirror on  maximal angle 31.5 mrad in the beam transport chamber at its diameter of 160 mm.

6. The manipulators of MCP detectors provide completely empty space for all aperture 200 mm of MCP vacuum chamber when MCP detectors are removed from chamber (see Attachment file).

7. I would like to ask you to send as some autocad files of your second mirror chamber and intermediate chamber placed between second mirror chamber and MCP chamber. Or, please, to contact with Wolfgang to incorporate our MCP chamber in your drawings to have common design of second mirror chamber, intermediate chamber and MCP chamber. Soon we send drawing of our MCP chamber together with bellow sections.

8. Please to send me confirmation on my questions.

Best regards, Evgeny

01.03.2012 20:07, Sinn, Harald пишет:

Dear Eugeniy,

1.) with regards to your first question, here is the current situation:

SASE1/2: The beam offset is 25 mm to 82 mm (meaning the beam travels 57 mm)

SASE3: The offset is 35 mm to 113 mm (78 mm travel)

The flanges of the second chamber are (as far as I know) centered with respect to the

two offsetted beams.

However, the best would be, if Antje sends you her actual excel sheets, where these

positions are precisely calculated. Also, I'm not so sure if our decision whether we

deflect left or right is yet final for all beam lines, but Antje could send you the current status on that as well.

(We are actually both on vacation next week).

We are planning to have on all mirror chambers in the same design

(with a horizontal translation of 80 mm), therefore your MCP

mechanical designs could also follow that strategy and

be the same on all three beamlines. (We actual reduced the translation and max angle

of the SASE3 beam offset a bit for that purpose with respect to the CDR values:

We have now 6.25 mrad to 20 mrad as a working range).

2.) I'm not quite sure if I understand your question. If there is no design-offset

between the beam pipe before and the MCP chamber, 5 mm alignment capability

seems enough for me.

One more thing to check:

In our recent component list the MCPs are on all beamlines 1.75 m

behind the center of the 2nd mirror. In you CDR you mention

2.05 m (SASE1,2) and 1.5 m (SASE3). In practice this distance will

be defined by the space we need after the second mirror chamber to

extract the mirror substrate (otherwise we have to take the MCP off every time

we change the mirror). Maybe Nicole can send you the actual numbers

from center of the second mirror to the beginning of your first flange

in our current CAD model.

Best regards

Harald

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On Mar 1, 2012, at 3:56 PM, Syresin Eugeniy wrote:

Dear Harald!

1. Please, to inform me about present horizontal offset relatively to beam axis for beam transportation tube chamber with DN160 flanges placed after second mirror chamber. Our MCP chamber will be connected with this photon beam transportation tube chamber through the bellow sections, placed before and after MCP chamber.

2. Also we assume the length of both bellow sections which should provide horizontal displacement of MCP vacuum chamber axis on 5 mm.

3.After your answers I send you tomorrow my comments to your questions given in your MCP referee letter from 22 February.

Best regards, Evgeny

 22.02.2012 13:10, Sinn, Harald пишет:

Dear Jan, dear Eugeniy,

I have some more remark concerning the MCP-CDR:

1.) For our operation and the machine protection logic it is

very important that all detectors can be completely removed out of the beam and then hit a limit switch that tells our PLC logic that

all MCP detectors and other devices in your chamber are safely out

of the beam.

Therefore I would like you to make a cut-drawing looking from the top

with all actuators at their maximum-out position. For all SASE1-3 devices there should be a gap of at least 80 mm (which is the maximum travel range of the second mirrors and therefore of the beam) plus the beam offset (25 mm at S1&2, 35 mm at S3) to let the direct beam pass through. This would then also define the relative position to our second mirror chamber.

A similar cut showing the max/min vertical position with the horizontal motions fully in would be also very useful (even though I would prefer to extract everything in the horizontal plane out of the beam).

2.) As Martin pointed out to Jan, the mirror chamber exit flanges are now likely to be DN160, therefore the reducer DN200 to DN63 should be replaced. Also, bellows before and after the MCP chamber should be foreseen to allow for alignment to the beam.

3.) The stand looks like it could tip over towards the side with the

long slides. For transport safety, the center of mass should be calculated and appropriate transport aids should be foreseen. The stand should be bolted to the floor and should have alignment capabilities. Further, you should foresee mounts on the chamber for the alignment people.

Bets regards

Harald

On Feb 3, 2012, at 7:46 PM, Gruenert, Jan wrote:

Dear colleague,

one of the X-ray photon diagnostics devices currently under development is the MCP-based detector (device 74-31-1).

This is an in-kind contribution to Work Package WP74 by JINR/Dubna/Russia, and the development at JINR proceeds

under the responsibility of Evgeny Syresin who has provided the attached report.

The next milestone is the Conceptual Design Review of this device.

You were identified as one of the CDR stakeholders (see attached list) for this device,

and we would like to ask you kindly to review the attached Conceptual Design Report.

Please provide a short written assessment of the general concept of the device.

- Are the European XFEL requirements met in your opinion?

- Is the concept conclusive with respect to feasibility , and what seems critical to you?

The question of MCP damage by direct XFEL illumination was already discussed by the experts and was

clearly identified as a topic that requires further investigation beyond what is presented in the report.

- Are there issues concerning integration into the tunnels and into the global concept for the facility ?

- Do you have recommendations what should be improved or which options should be further studied ?

We would appreciate if you could find the time for review and returning an assessment until February 20th, 2012.

Best regards,

Jan Grünert