SERA

Fabrication of a photo-injector for the CTF3 accelerator and for the NEPAL test stand

PHIN

WP 4 of the JRA2 PHIN

1. Status of the construction of RF guns

2. Status of the construction of the NEPAL beamline

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1.Status of the construction of the CTF3 photo-injector

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•Modification of the technical drawings of the gun upon a CERN request
due to the insertion of photo-cathode transfer chamber (August)

⇒ All the cooling channels in the gun had to be re-designed

⇒ Makes difficult to support the gun

•Finalization of the technical drawings of the NEG envelop around the gun
Strong collaboration with CERN is mandatory since the NEG coating
is done there
=> drawings almost finished

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1. Status of the construction of the CTF3 photo-injector

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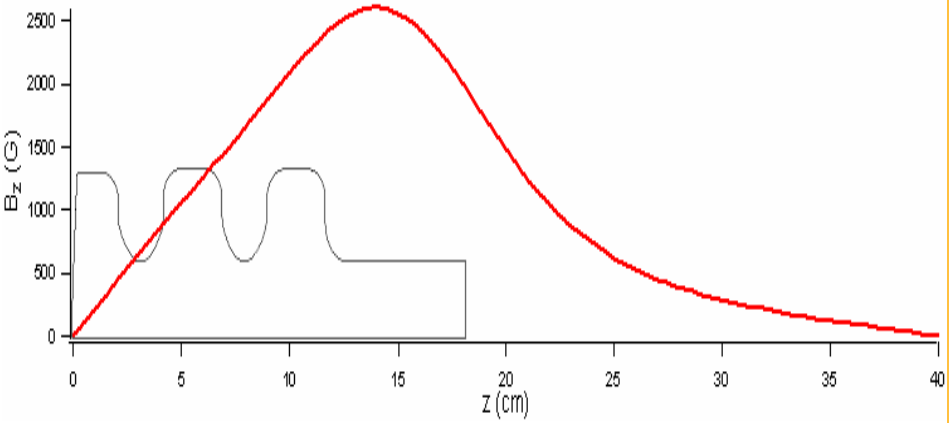
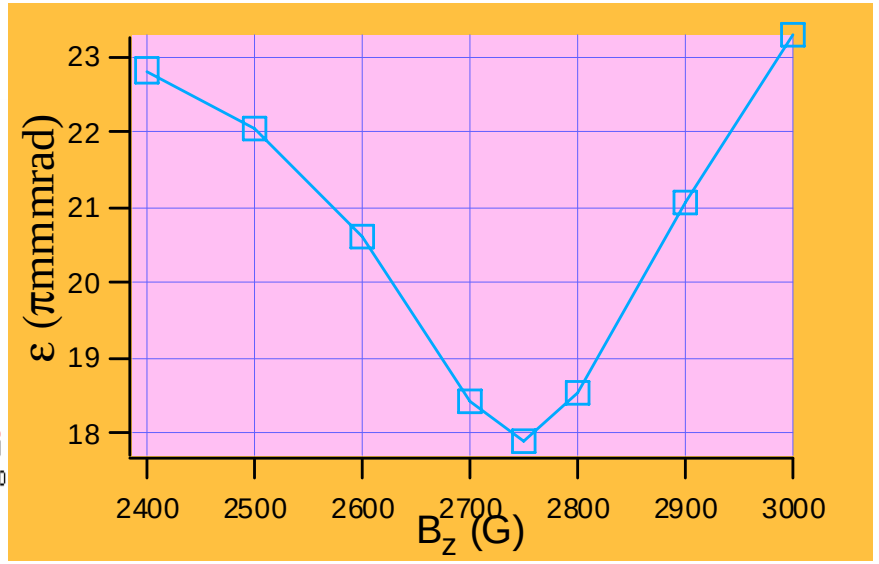
•Modification of the magnetic design: 2 coils instead of 3

No enough space for pumping with 3 coils





With a laser gaussian pulse

Solenoids ordered in June, one was modified in September taking into account the data of the CERN cooling system

=> Should be delivered by the end of this month

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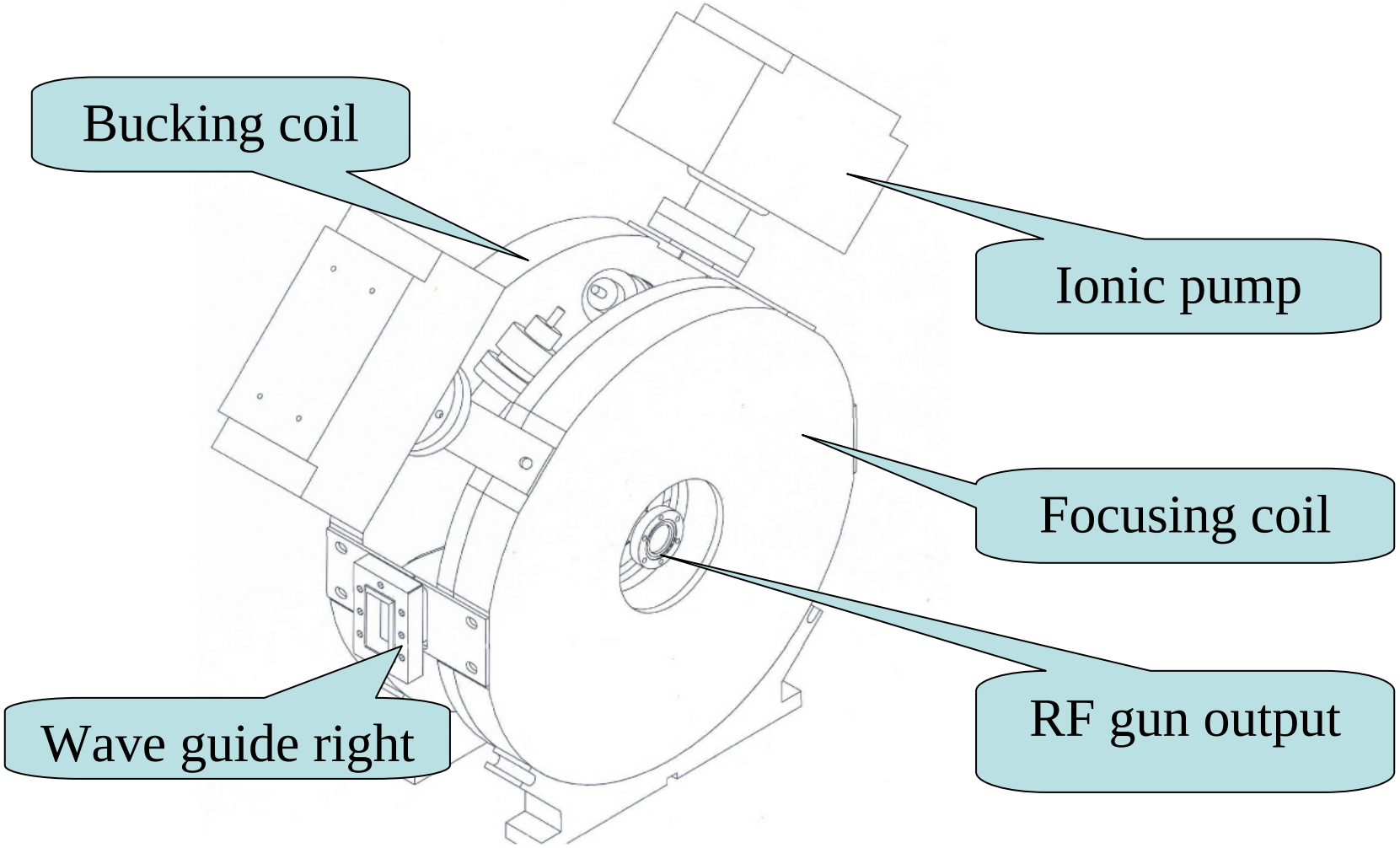

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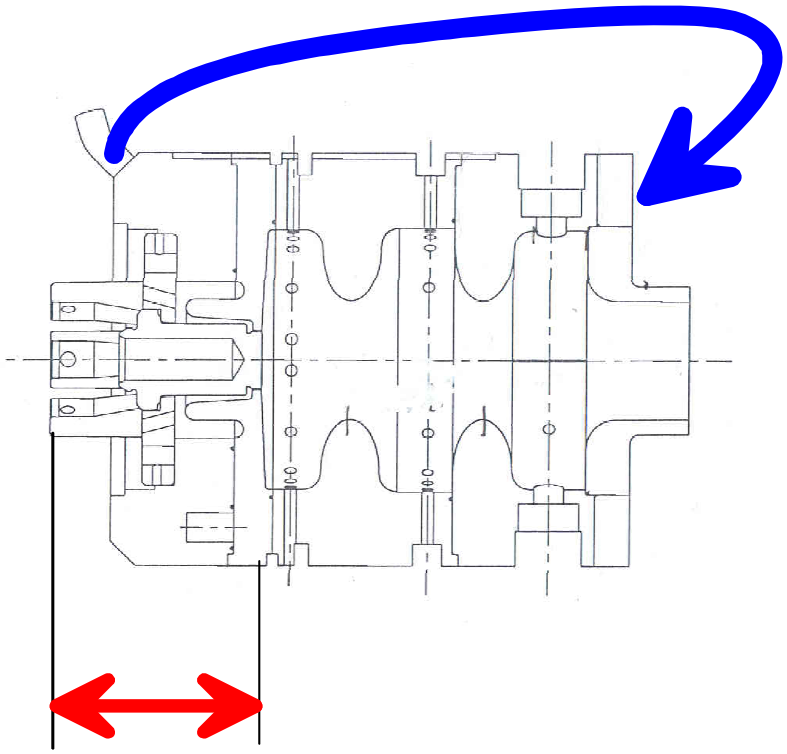
Modification from the initial drawing



1 Reduction of the cathode chamber

2 Migration of cooling pipes to the end of the gun

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1. Status of the construction of the CTF3 photo-injector

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Construction of a cold model to valid RF simulations

History:

- **Ordered in March a test piece to check :**

-iris profile
-roughness
-mechanical accuracy

- **Test cavity received in April**

Iris profile not satisfying, another item O.K.

- **Several tries later, order in beginning of June, foreseen delay: 8 W**
- **Last piece received in November 4** th

(the firm begins (we suspect) the work only in October)
- Checking at LAL:
general accuracy: 5 µm, roughness: < 0,4 µmRa , iris profile O.K.

Set up of the RF measurement apparatus begun the 14th
Duration: 2 months but we hope to order the final gun before the end of the year

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1. Status of the construction of the CTF3 photo-injector

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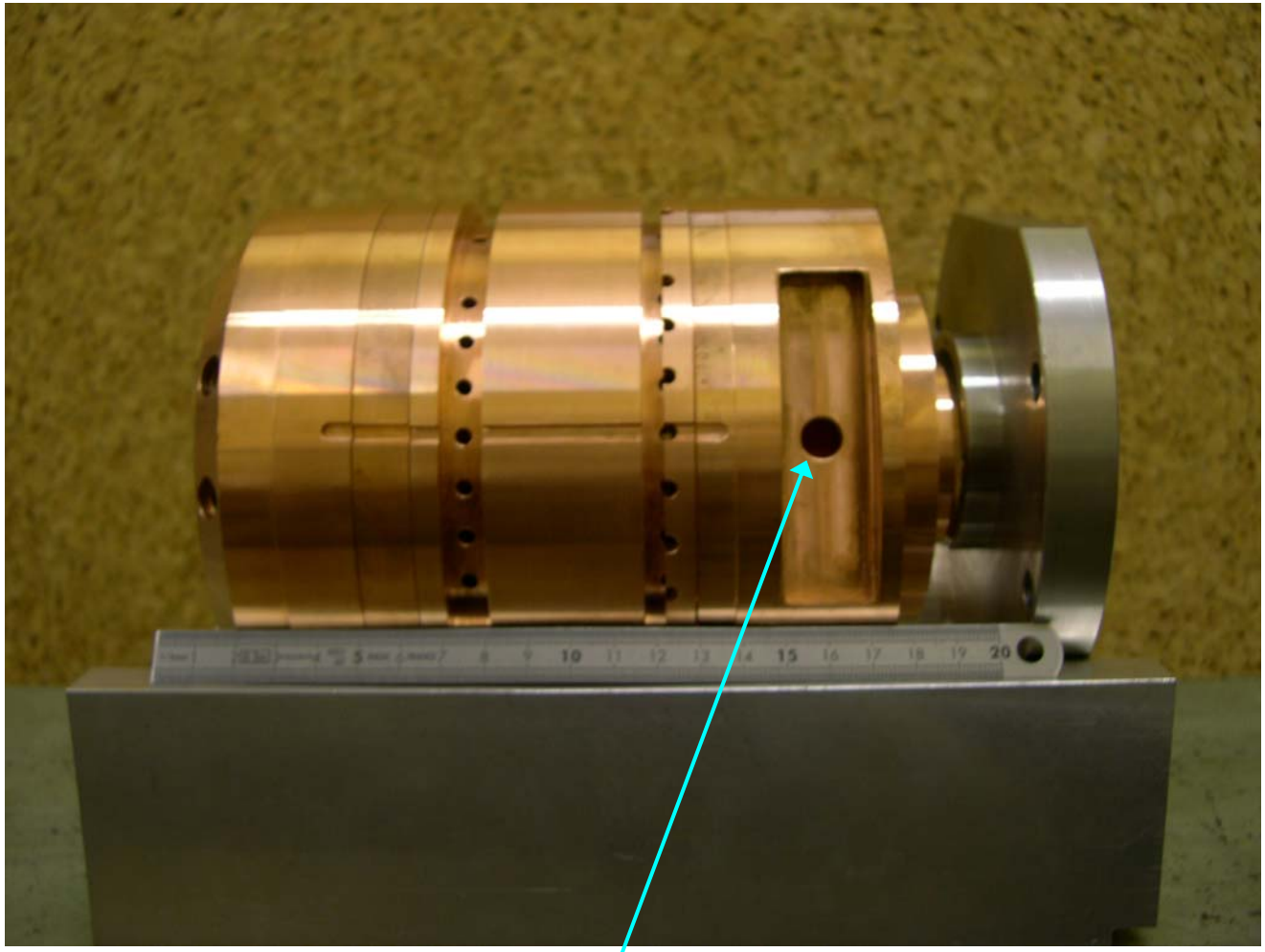

Coupling aperture (before opening)

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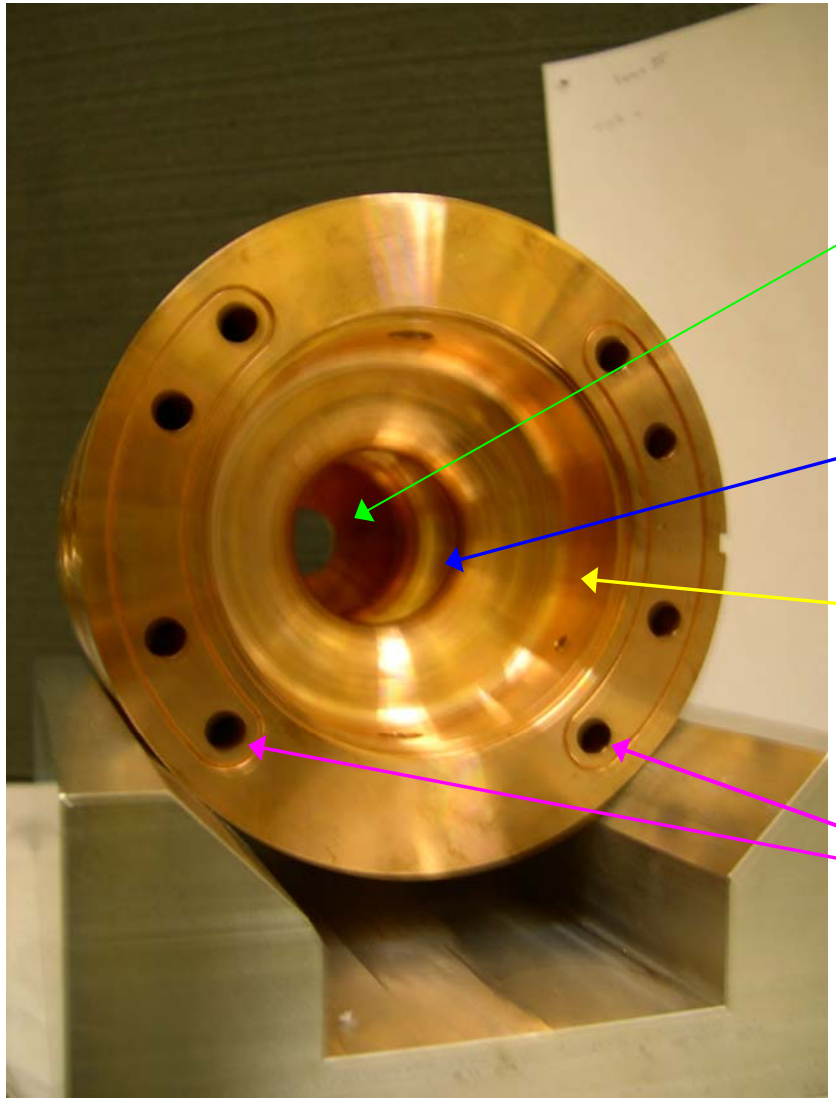

First half cavity with the hole for the photo-cathode

Central cavity

Last cavity with coupling holes

Cooling channels

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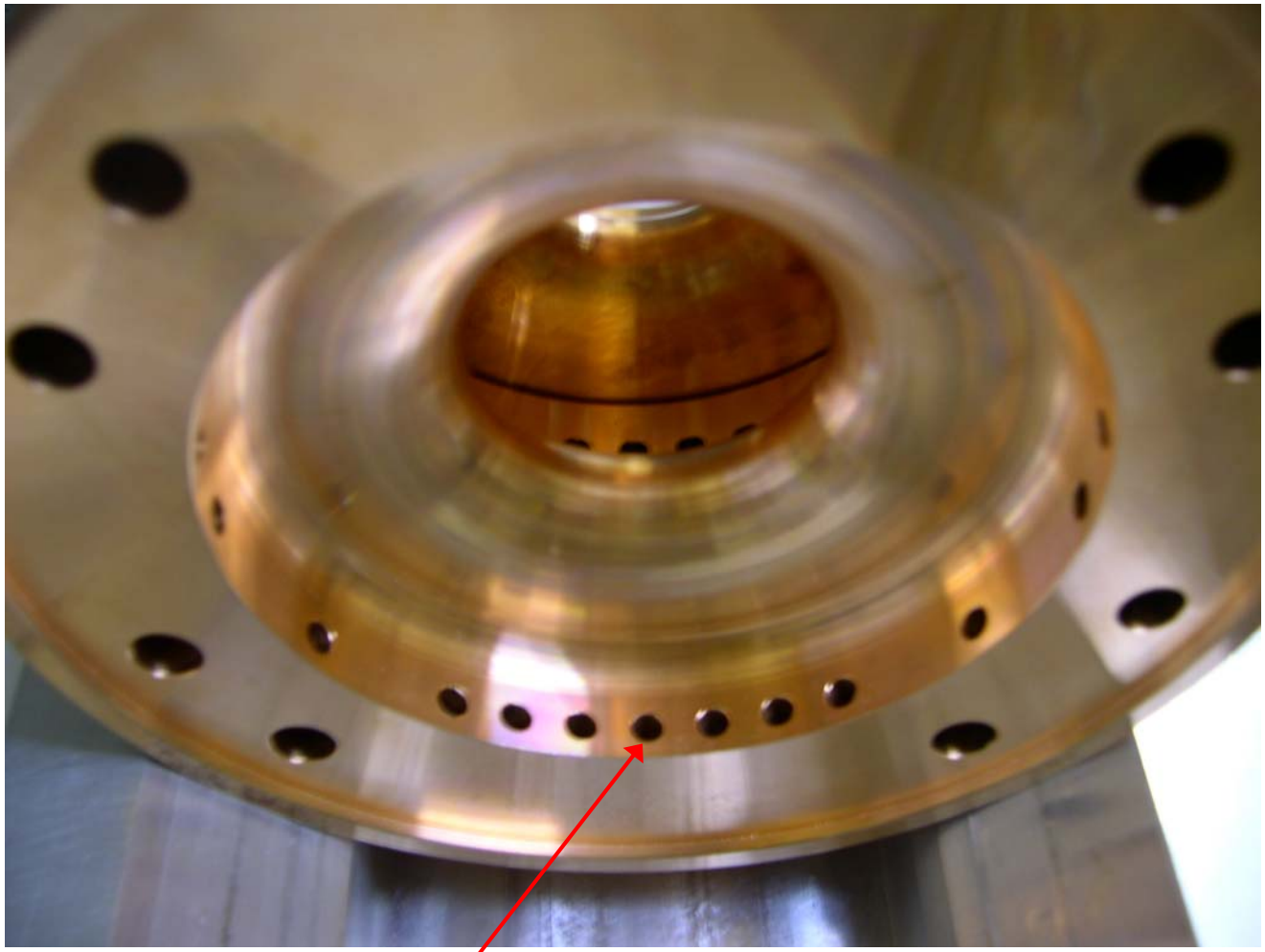

Holes for NEG pumping

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2. Status of the construction of the NEPAL beam line

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Laser :

Ordered in July
Expected at LAL in the end of this year

Preparation chamber :

In progress in the LAL workshop

Beam-line :

A possible design exist
A lot of drawing elements are readies
The final studies are in expectation (lack of manpower)

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Short term program

1. RF measurements on the cold model

   final dimensions of cells and coupling holes

2. Ordered in December the two RF guns

   with a reserve on the final inner dimensions

3. NEG deposition

   Test of compatibility of SS/NEG (CERN specialists request) in the beginning of 06

3. First laser tests

   end of this year