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PHIN

Status report of RF guns construction at LAL

21-23 January 2008

G. Bienvenu, M. Desmons, M. Joré, B. Mercier, J. Prevost, C. Prevost, R. Roux
LA L, IN2P3-CNRS, Université Paris-Sud, France

1- Construction of the photo-injector for the drive beam linac (PHIN)

2- Construction of the photo-injector for the probe beam linac

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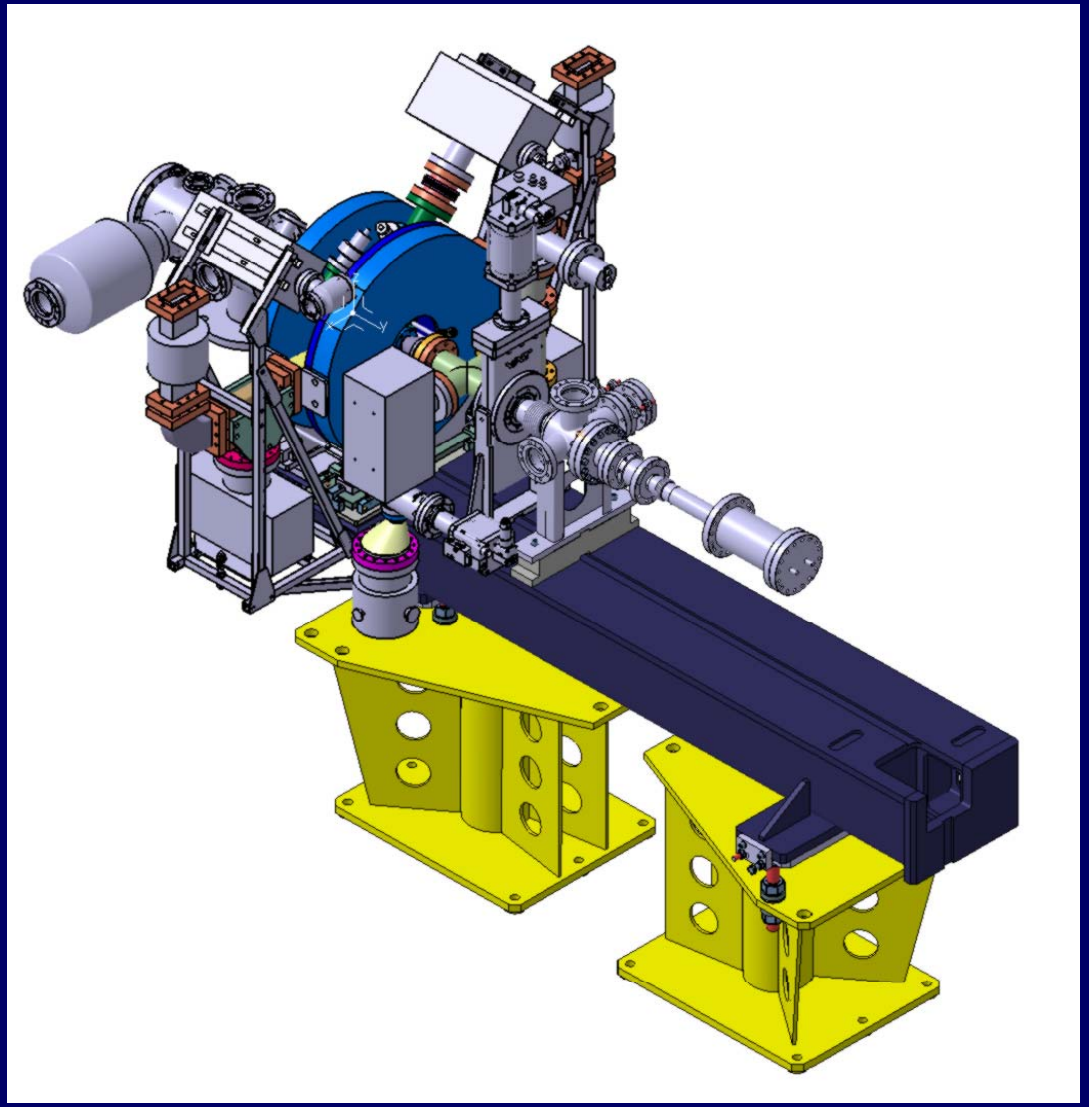
1- Construction of the PHIN gun

The drawing:



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1- Construction of the PHIN gun

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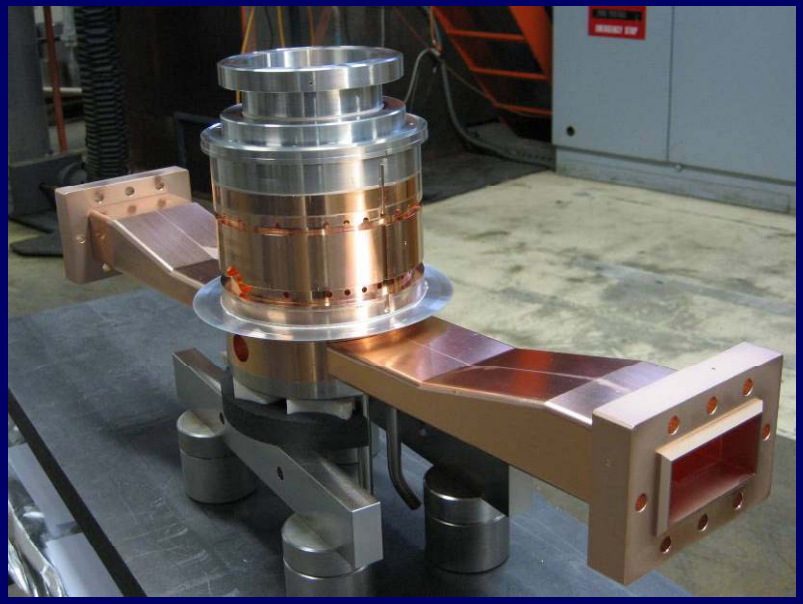
Where are we since the last collaboration meeting?

All pieces of the gun sent to CERN to be brazed

=> gun brazed in December, 19th



BUT:
Big leaks in the cooling tubes

CERN brazing workshop
hopes to fix the problem

Delivery date: ??

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1- Construction of the PHIN gun

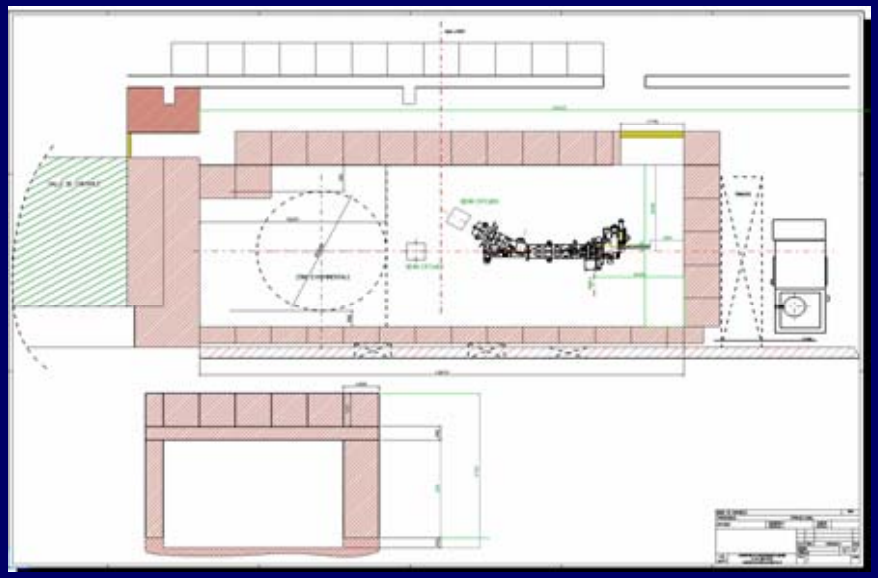
There is a twin photo-injector, to be installed at LAL (JRA objectives)

Brazing was delayed because one cell was used for the CERN gun:
and we decided to do it at LAL

Completion of brazing: mid-March

Accelerator ready by the end of Spring

Tapered waveguides are brazed



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2- Construction of the probe beam gun

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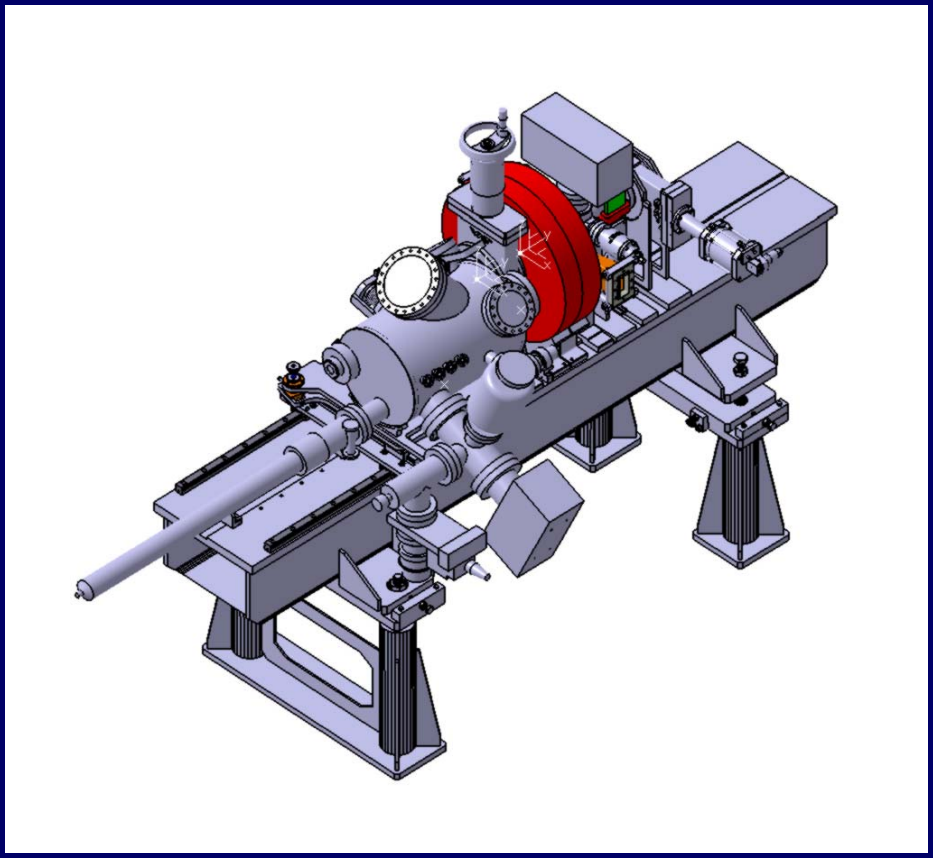

- Last year, all components were already there
- End of February: pieces of the gun were available to be brazed

!! Again, big delay
due to brazing problems
Change of staff

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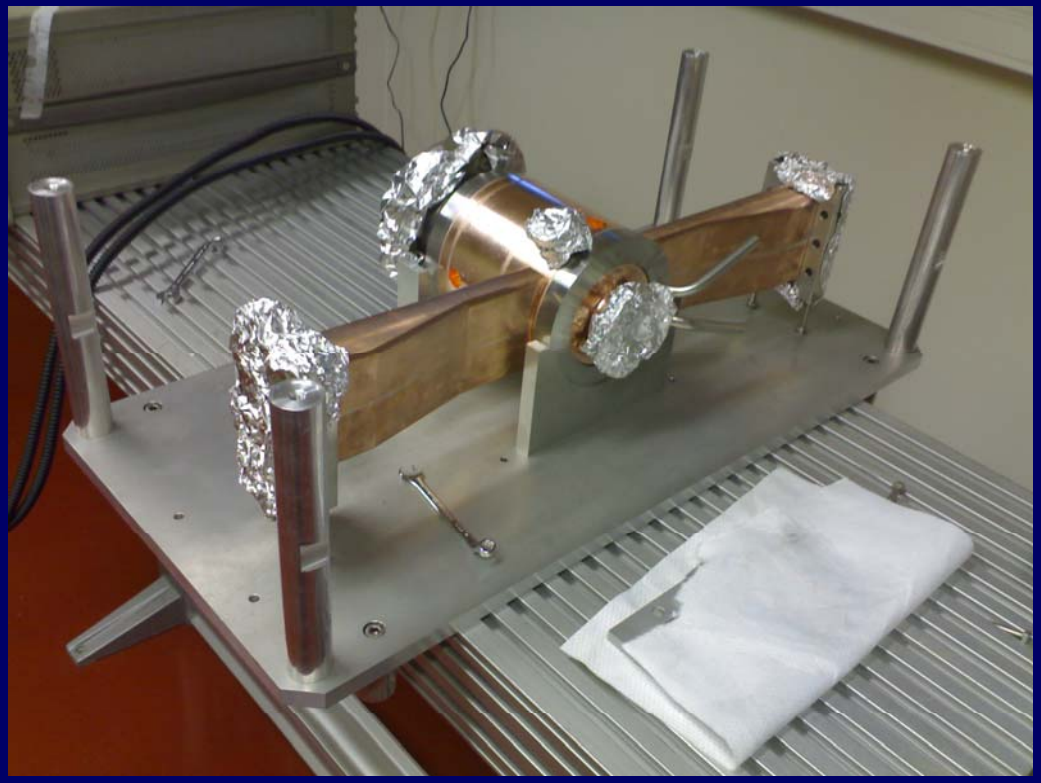
2- Construction of the probe beam gun

Finally, gun was brazed just before Christmas and no leak at all



BUT

F_r = 2996.025 MHz !!

Before brazing, f = 2997.9 MHz

Fortunately, we have two holes/cell
Thickness of cavity wall ≈ 4 mm
=>deformation with a screw
to increase the frequency
in every cell to keep well balanced
electrical field.

Finally: fr = 2998.057 MHz for T = 20°C, H = 60 %, P = 1015 mbar
Width at -3 dB = 452 kHz => QL = 6633 => β = 0.96 => S11 = 0.02
Field (perturbation method):

Half cell: Δf = 780 KHz	Middle cell: Δf = 780 KHz	Coupling cell: Δf = 790 KHz

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2- Construction of the probe beam gun

PHIN

Now, installation of components on the girder while I am speaking!

Date of delivery at CERN: January, 4 -14