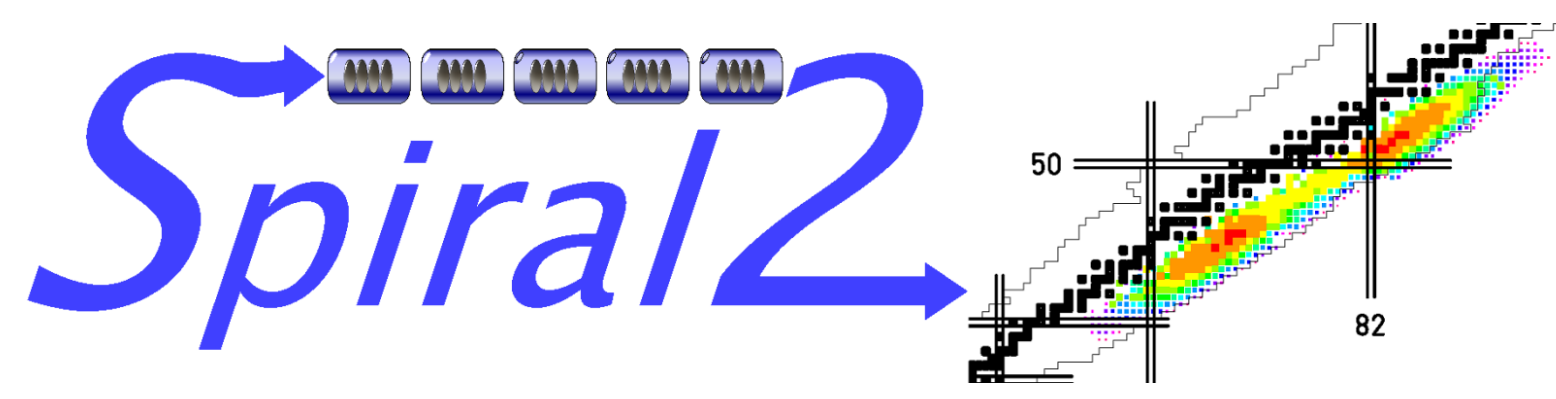


Assembling, Testing and Installing the SPIRAL2 Superconducting LINAC



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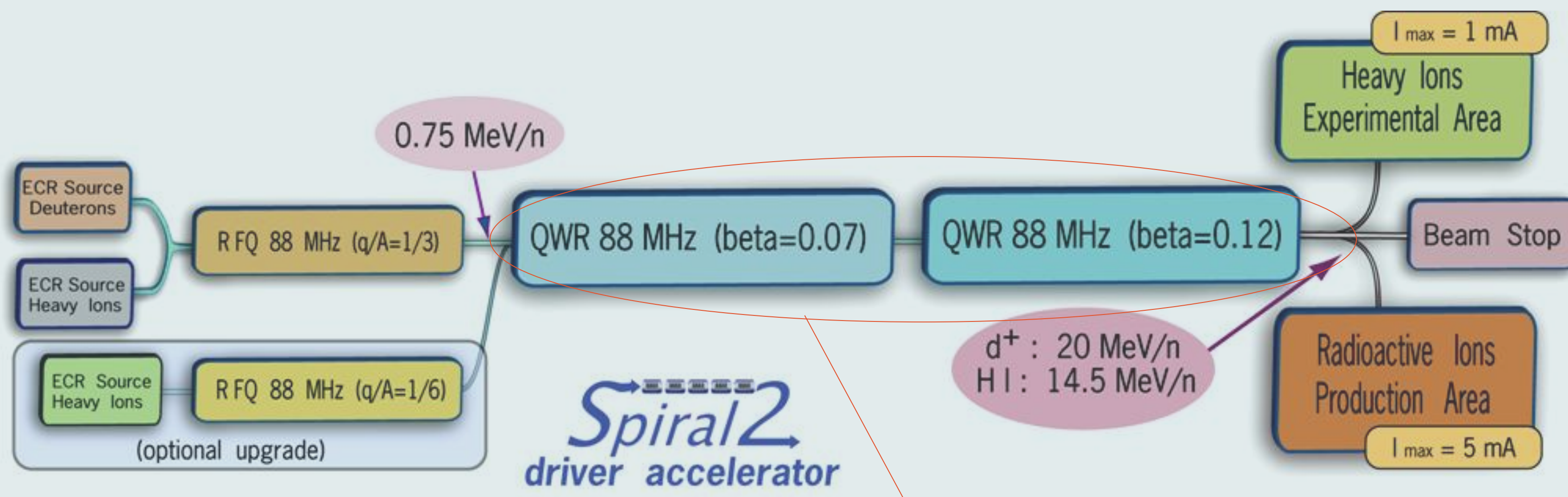
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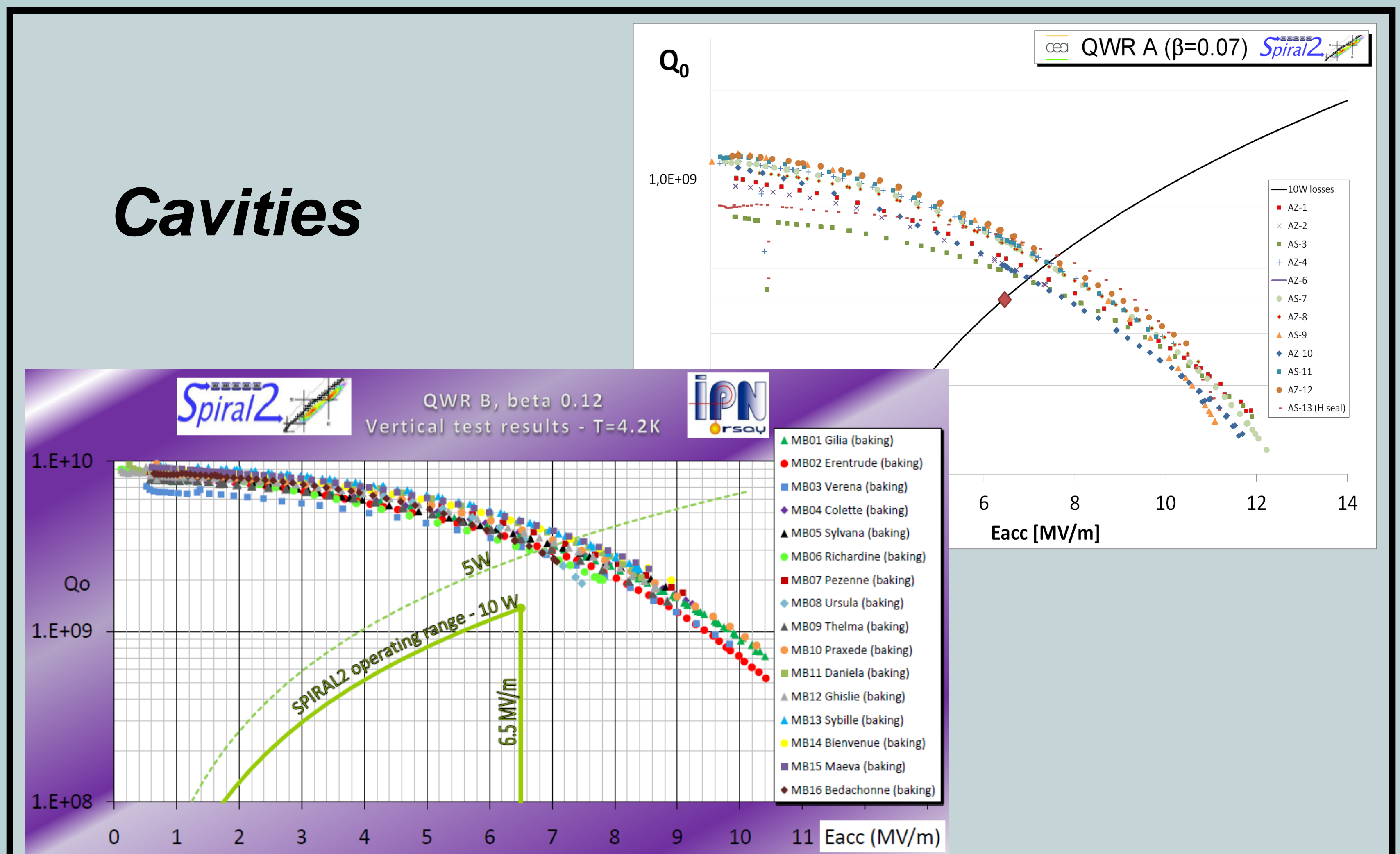
The SPIRAL 2 accelerator



This poster !

TESTING

Cavities



- ✓ All low β cavities (12) have been tested in vertical cryostat.
- ✓ All 14 high β cavities (14) have been tested in VC; all are tested again with tuning plunger (nearly completed).
- ✓ All tested cavities are qualified (above specs).

ASSEMBLING

Cryomodules

- Low β Cryomodules : 6 completely assembled, 2 partly assembled (beam vacuum sealed), 4 not yet assembled.
- High β Cryomodules : 1 completely assembled, 2 partly assembled, 4 not yet assembled.
- Alignment remains to be adjusted on some cryomodules.

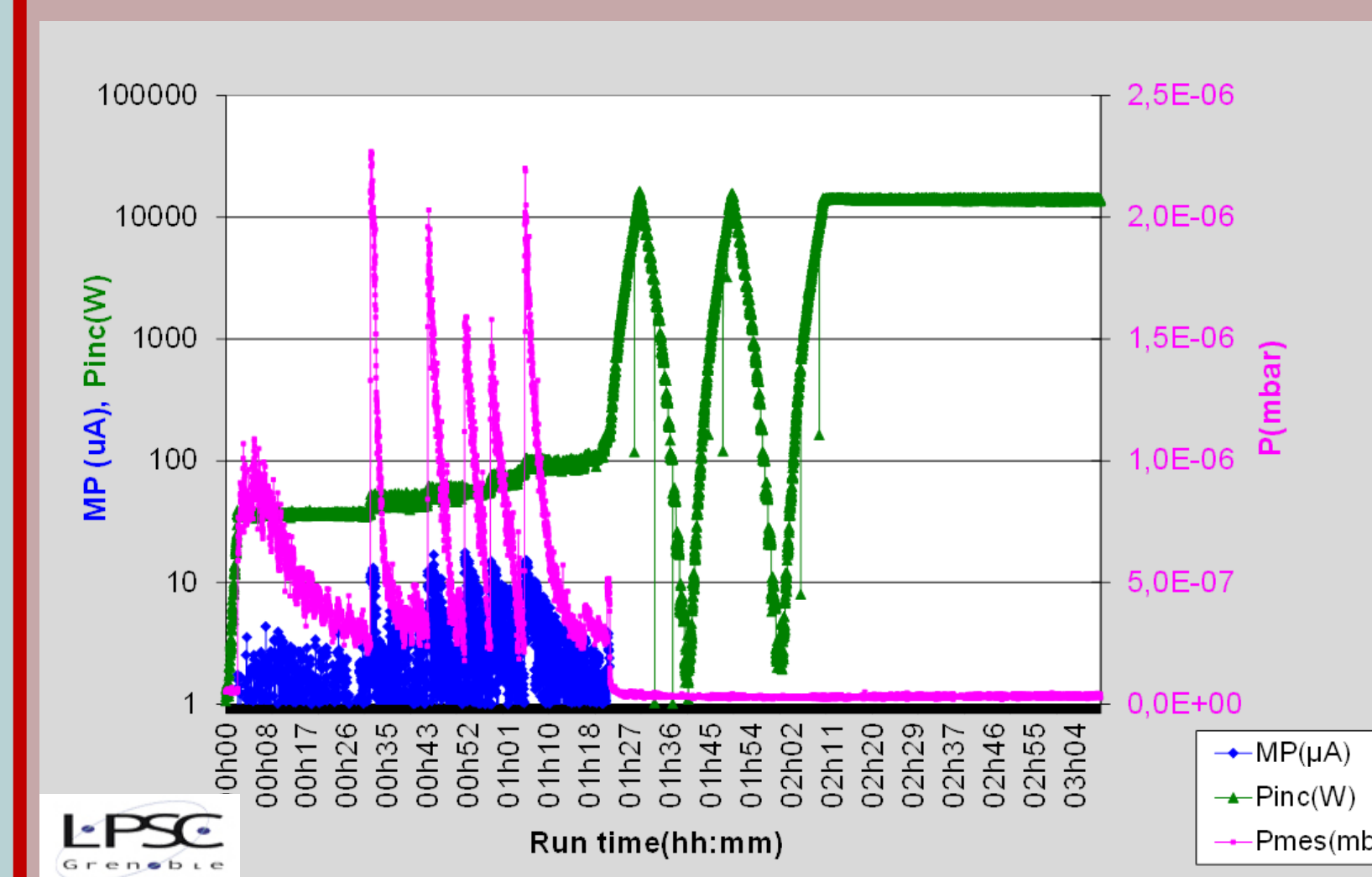


Power couplers

- ✓ Only 12 power couplers are still to be prepared.
- ✓ Assembly is proceeding smoothly following optimised preparation procedures.
- ✓ Assembly was delayed by unforeseen valve baking (necessary to lower EPDM outgassing inside beam vacuum).



Power Couplers



- Fast conditioning on dedicated bench (open circuit condition).
- Conditioning time decreased thanks to the optimisation of the preparation procedures.

Warm sections

- Assembly by GANIL team in a CEA Saclay ISO5 clean room.
- Important delay caused by strong outgassing of EPDM sealed valves.
- Problem now solved, but still concerns with Helicoflex™ seals.



Cryomodules

	Unit	Specs	CMA4	CMA6	CMA7	CMA2
Max accelerating field	MV/m	> 6.5	8.8	8.3	9.0	8.6
Total losses @4K	W	< 20.5	20.8	11.4	11.8	15.7
Static losses @4K	W		6.5	4.0	4.1	3.2
Pressure sensitivity	Hz/mbar	< 5	-1.58	-1.32	-1.45	-1.31
Beam vacuum	mbar	< 5e-7	1.5e-7	2.0e-8	1.1e-8	4.3e-8
Beam vacuum leaks	mbar.l/s	< 5e-10	9.5e-10	< 1e-10	< 1e-10	< 1e-10
Cavity alignment	mm	⊙ 1.3	0.52	0.40	0.48	1.46

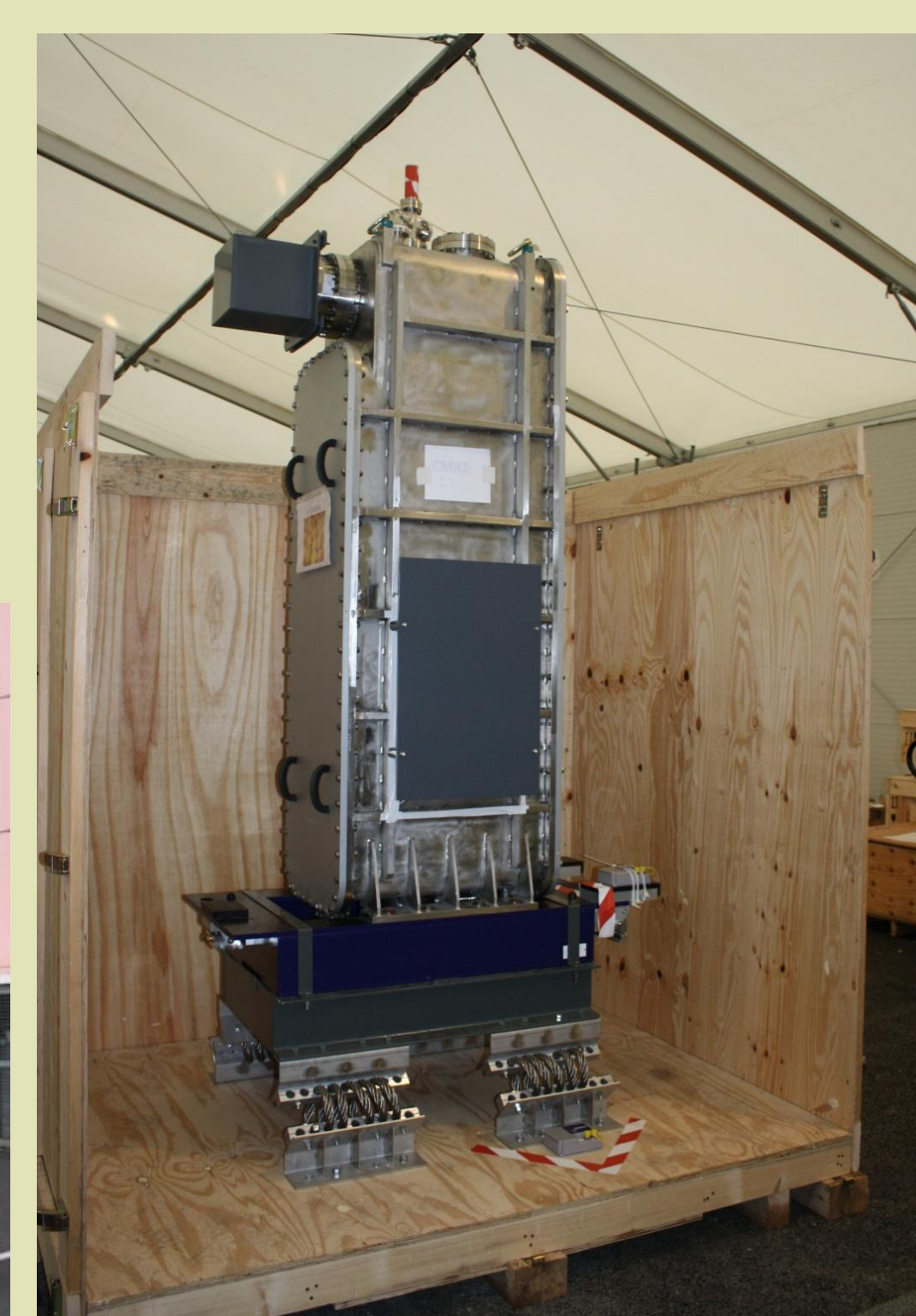
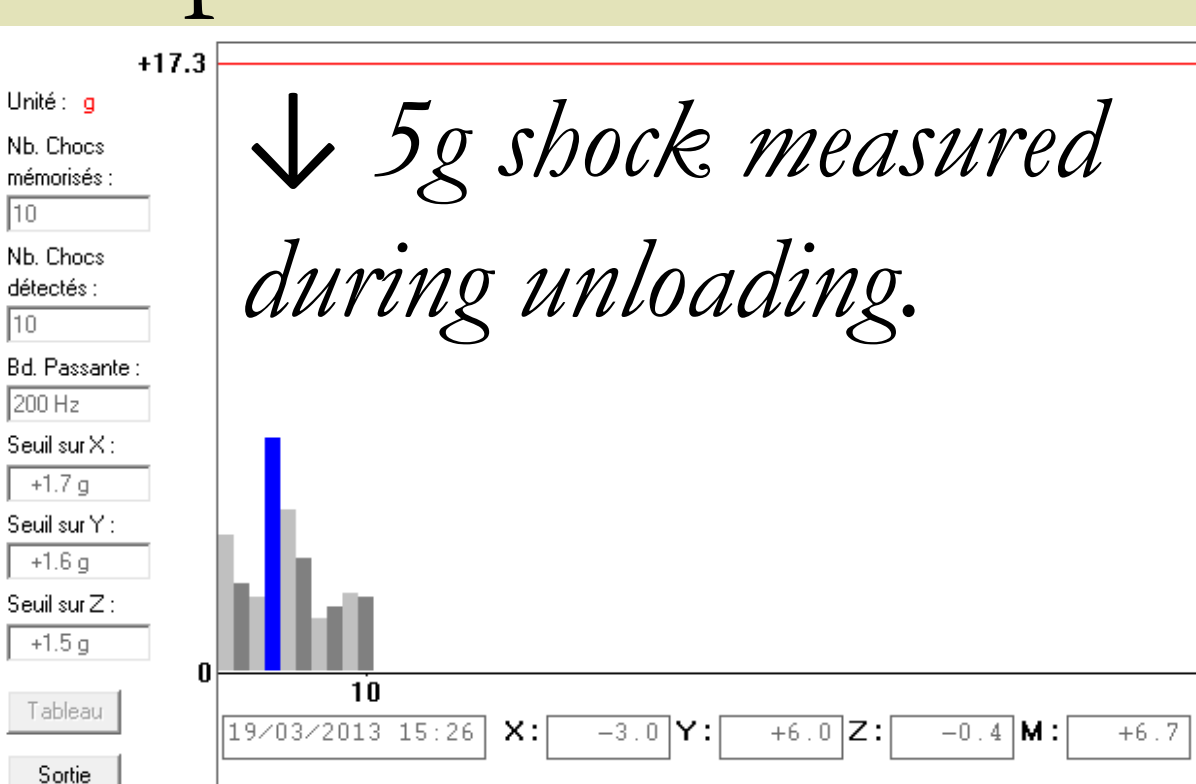
← Performances of the low β cryomodules already qualified.

- ✓ Pollution problems have been eliminated.
- ✓ Three low β cryomodules are OK, alignment to be adjusted for a fourth one (RF tests OK).
- ✓ One high β cryomodule is OK, alignment to be adjusted for another one (RF tests OK).
- ✓ Next low β cryomodule test to begin next week.

INSTALLING

Cryomodules transportation

- ✓ Transportation test between Saclay and GANIL performed to verify the efficiency of the vibration damping system.
- ✓ Cold tests and alignment checks done before and after transportation showed no degradation of performance.



Installing the cryomodules

- ✓ Actual installation of cryomodules in the tunnel to begin T4 2013.
- ✓ Cryomodules are delivered to GANIL, then transferred in the tunnel on dedicated tooling.
- ✓ Installation on linac, connection to cryogenic valves box.
- ✓ Final tests (vacuum, alignment, RF).
- ✓ Connection to neighbouring warm section: laminar flow, preliminary cleaning, particles count (ISO5). ⚠ Space is very tight between two cryomodules.

