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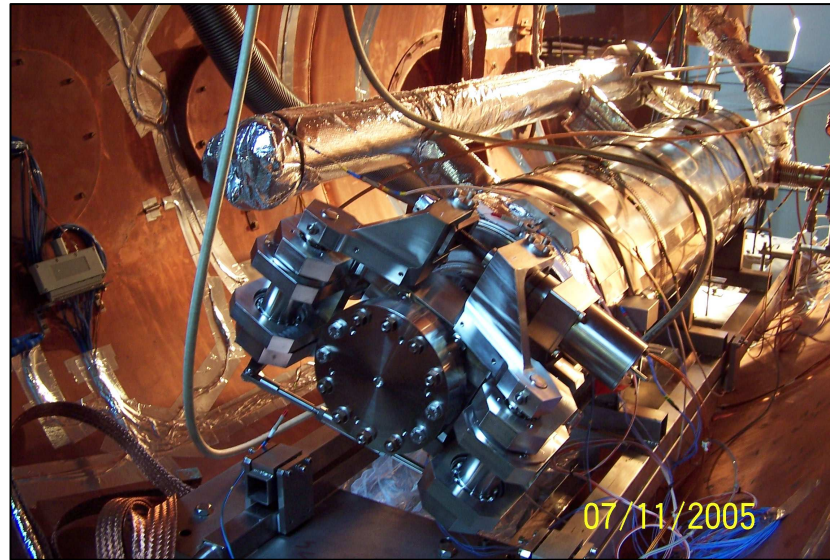
WP 10 Report

RF Power Test in CryHoLab

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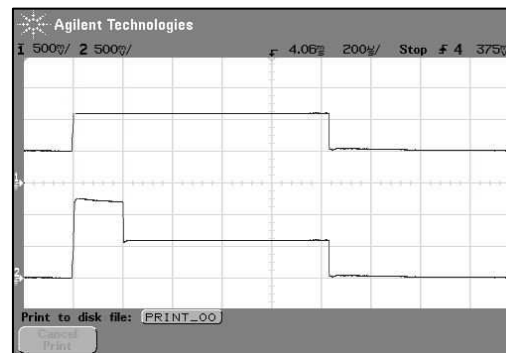
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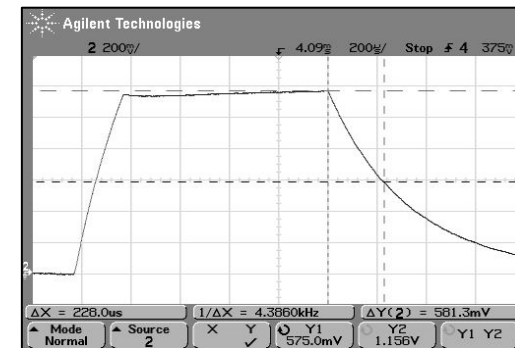
full equipped
9-cell cavity (C45)
with TTF III coupler
& piezo cold tuning system



Thales Klystron
1.5 MW - 1 ms - 6.25 Hz



pre-pulse on RF power
4P/P (200 μ s / 800 μ s)

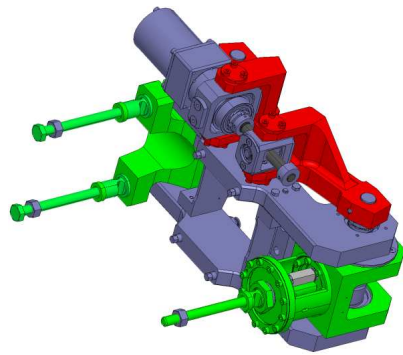


RF flat top on P_+

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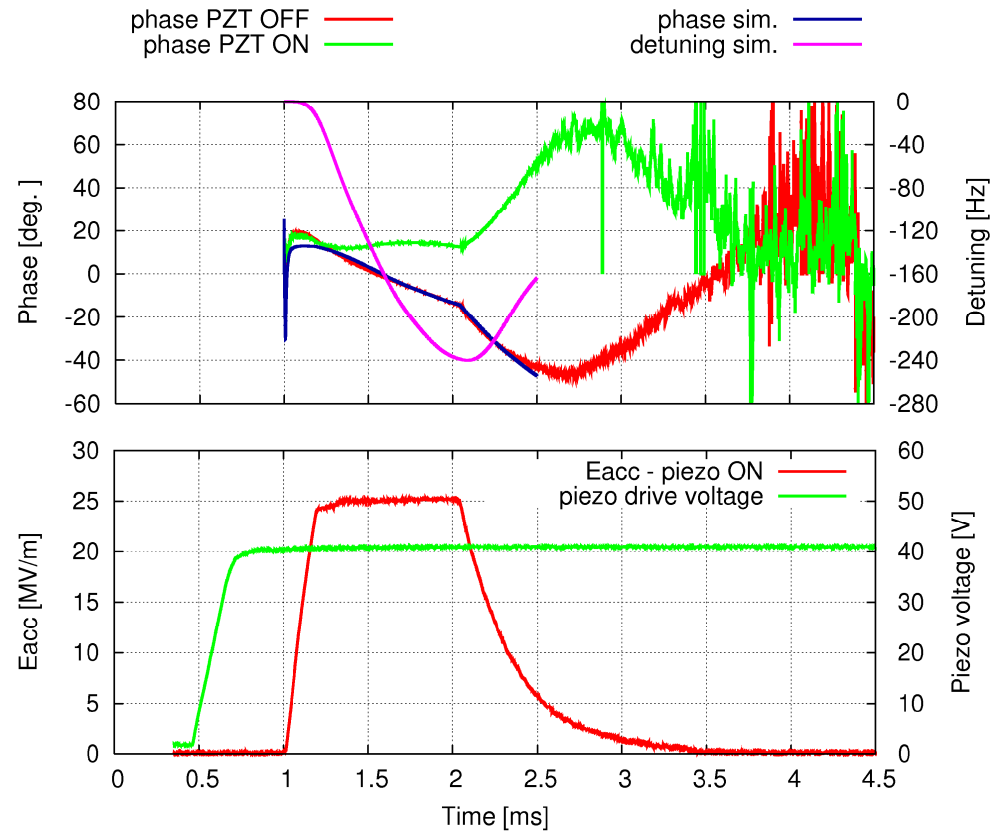
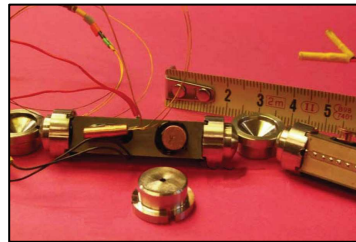
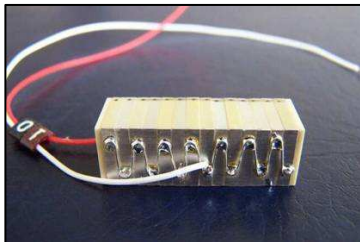


Full tuning range: 460 kHz @ 2K

Piezoelectric Actuator PZT

length : 30 mm

150 V → 3 μm @ 2K → Δf : 1 kHz



NOLIAC

PICMA from PI

characterized by



G. Devanz et al. **THP016** LINAC'06 **MOPCH140** EPAC'06
→ LFD compensation

M. Luong et al. **THPCH159** EPAC'06 → μ-physics analysis

RF Infrastructure Transfer

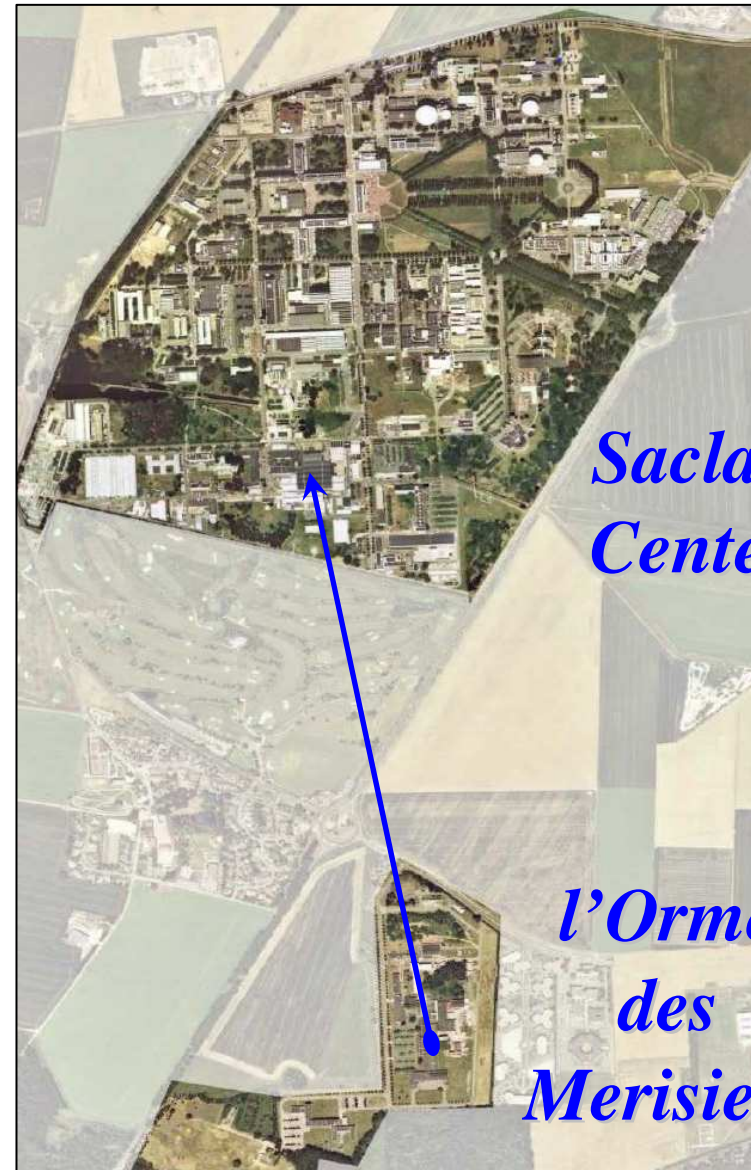
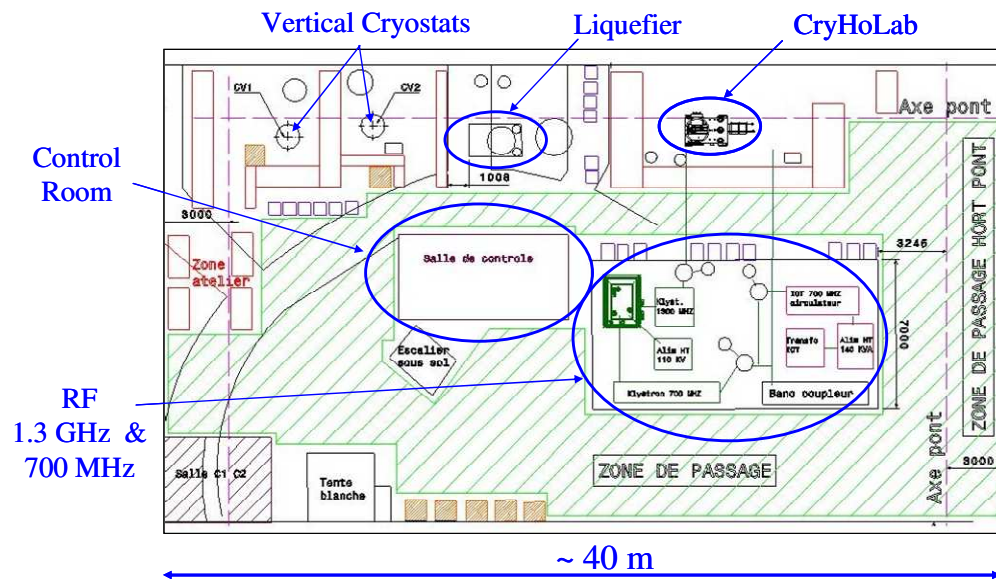
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May - December 2006

Vertical & Horizontal cryostats
Helium plant (liquefier...)
RF Power (klystrons...)



Saclay
Center

l'Orme
des
Merisiers

RF Infrastructure Transfer (cont.)

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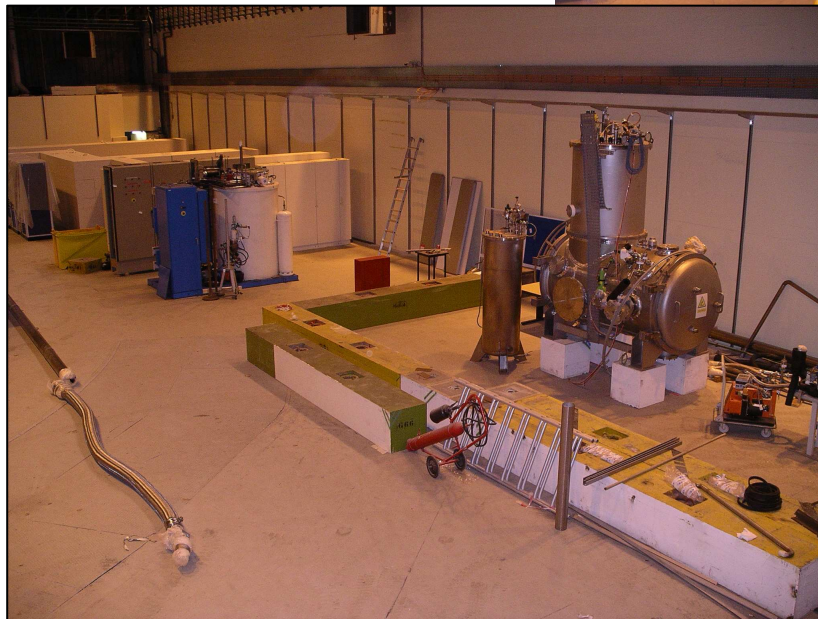
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November 2006

Site Views :

September 2006



VT stand + Liquefier + CryHoLab

RF Infrastructure Transfer (cont.)

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Site Views :

November 2006

September 2006



He Compressor + Pumping System

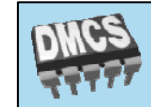
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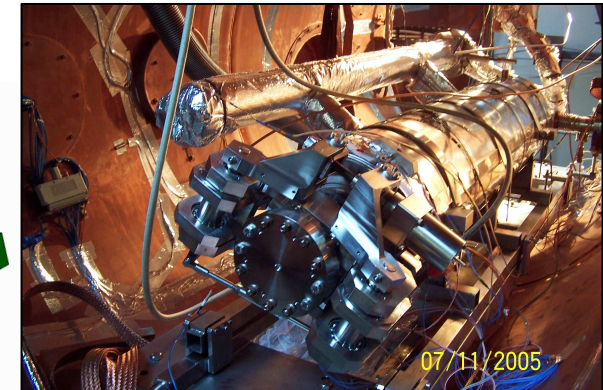
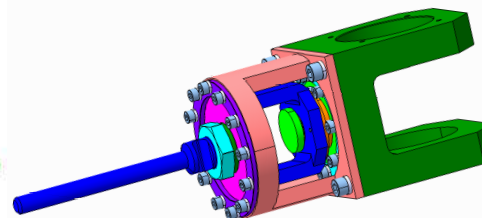
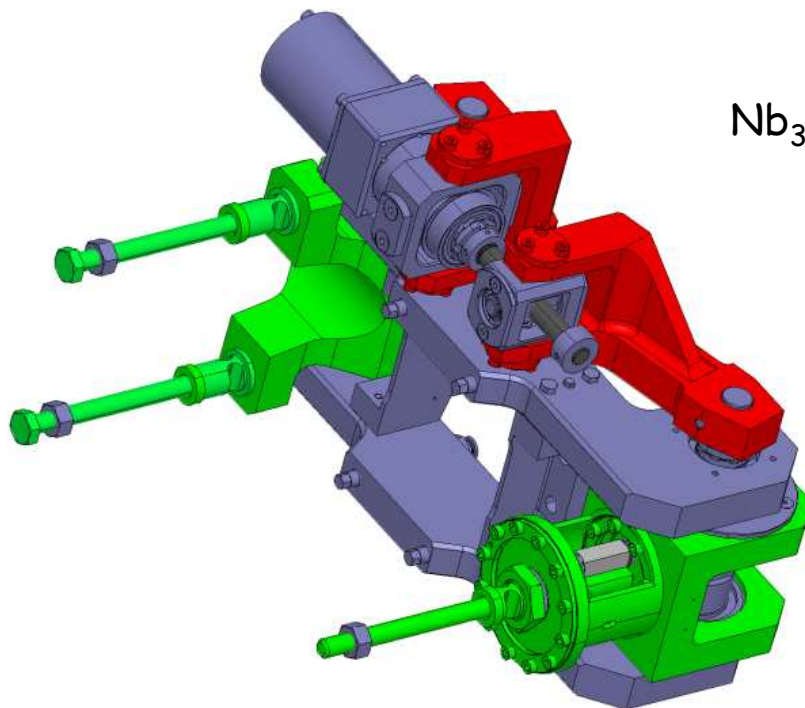
Next integrated experiment (WPs 8+10) with Magnetostrictive Fast Tuner

Collaboration with Technical University of Lodz



Magnetic Smart Material
from ENERGEN

Nb₃Sn superconducting coil



modification under manufacturing (4.4 k€)

+ adapted CTS cooling

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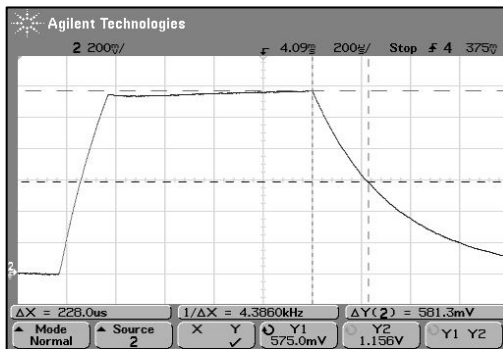
$$* E_{acc} = \frac{1}{L} \sqrt{P_t Q_t R/Q} = \frac{1}{L} \sqrt{4 P_i Q_L R/Q} \approx \boxed{25 \text{ MV / m}}$$

$$L = 1.038 \text{ m} \quad R/Q = 1036 \Omega$$

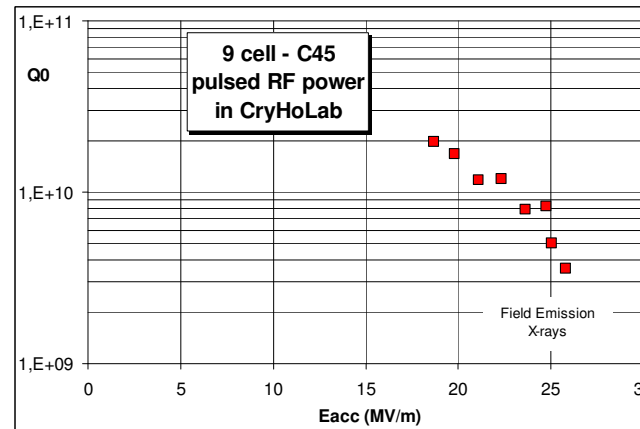
$$Q_t = 2.17 \cdot 10^{11} \quad Q_L \approx Q_i = 1.41 \cdot 10^6 \quad (\tau_{1/2} = 240 \mu\text{s})$$

$$P_{klystron} = 130 \text{ kW} \quad P_i \approx 118 \text{ kW} \quad P_t \approx 3.2 \text{ W}$$

$$* Q_0 = \frac{P_t Q_t}{P_c} = \frac{P_i Q_L}{P_c} \quad P_c \rightarrow \text{calorimetric measurements} \quad (1.1 \text{ m}^3 / \text{h} = 1 \text{ W})$$



Pulsed RF @ 1.7 K
(70 → 130 kW-0.87 Hz)



- Diagnostic tool improvement :
flowmeter higher accuracy
(low power)
- Larger biphasic vessel
(instabilities @ high power)
- New regulation valve @ 1.7K
- Other method (Pc):
avoiding pressure fluctuation
servo-control with R-heater

Damage on Coupler Bellow

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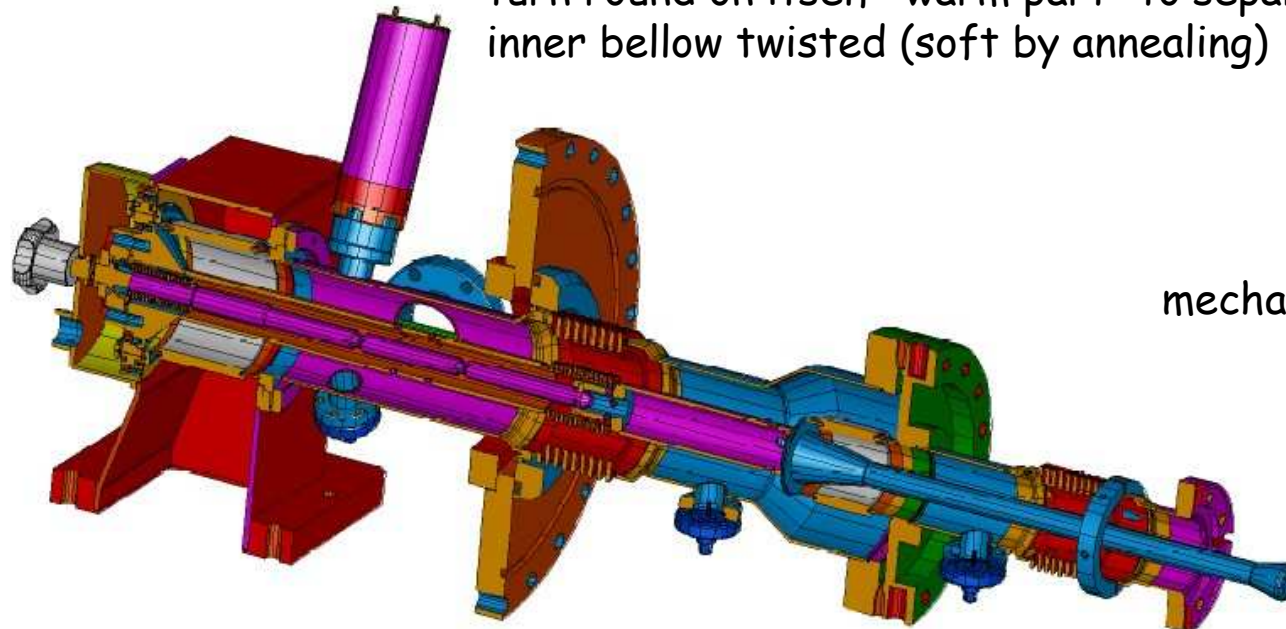
HPC dismantling :

3 times without problems

last time impossible to extract screw (partly thread) : tightening

Consequence :

turn round on itself "warm part" to separate warm and cold parts
inner bellow twisted (soft by annealing)



mechanical repair is required

Infrastructure Transfer

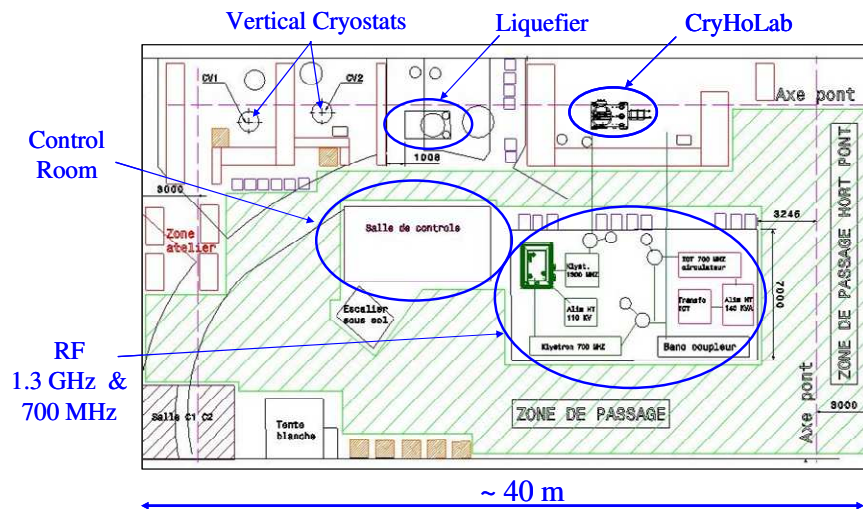
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RF tests restart in Jan. 2007
for vertical cryostats

and CryHoLab just after
(as soon as liquefier is OK)



2007 (?)
Chemistry & Clean Room
in nearby building