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European SCRF Infrastructure

&

RF Test Facility at Saclay

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Main Requirements

to prepare 9-cell cavity @ 1.3 GHz

Θ	Field Flatness	(no suitable equipment)
Θ	Electropolishing	(just for mono-cell)
?	HPR – Clean Room – Assembly	(low ceiling for HPR)
O	RF test in vertical cryostat	(CW)
O	RF test in horizontal cryostat (cavity + auxiliaries)	(high power pulse)

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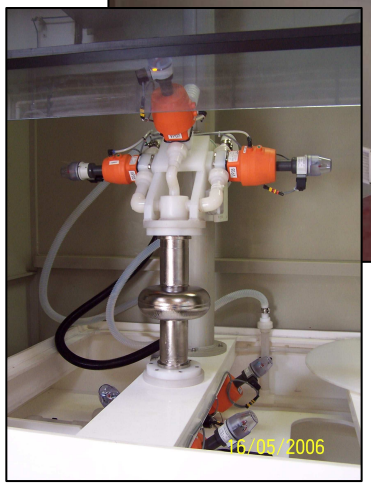
Chemical Treatments

Electropolishing
(mono cell)



BCP
(multi cell)

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Clean Room

HPR station
not well adapted
for 9-cell
(1283 mm)

ceiling height 1350 mm
(above HPR nozzle)

Vertical Cryostat (CV-1)

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$Ø_{useful}$ = 700 mm - H = 2.92 m – H_{LHe} = 1.2 m @ 1.7K
Consumption 1500 liters / test
2 vacuum pumping groups (roots : 1900 m^3/h - 1 g/s @ 13 mb)
CW RF power unit 200 W (700 to 1500 MHz)
Magnetic shields (μmetal & coils) - B_{res}~2mG

3 inserts

cavity connected

ready for RF test

Horizontal Cryostat (CryHoLab)

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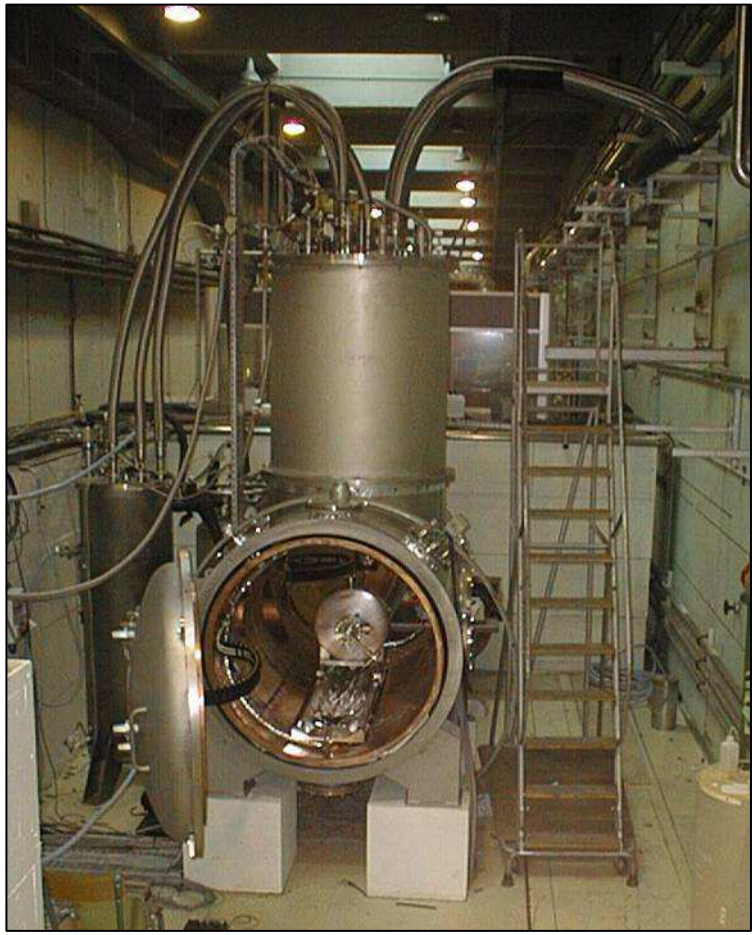
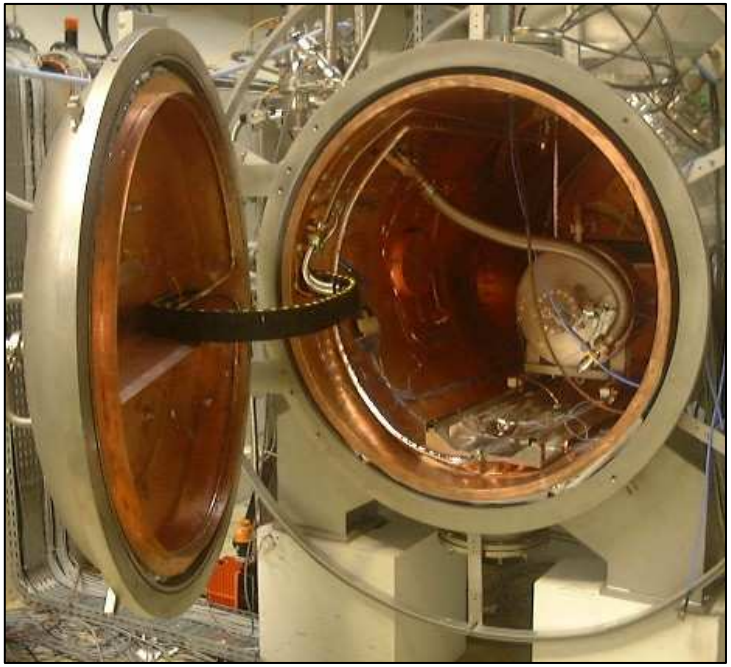
$Ø_{useful}$ = 700 mm - L_{useful} = 1.5 m
Consumption 30 liters / hour
Magnetic shields (μmetal – coils) – B_{res} ~ 20 mG



cryoperm structure
around the cavity



Horizontal Cryostat (CryHoLab)

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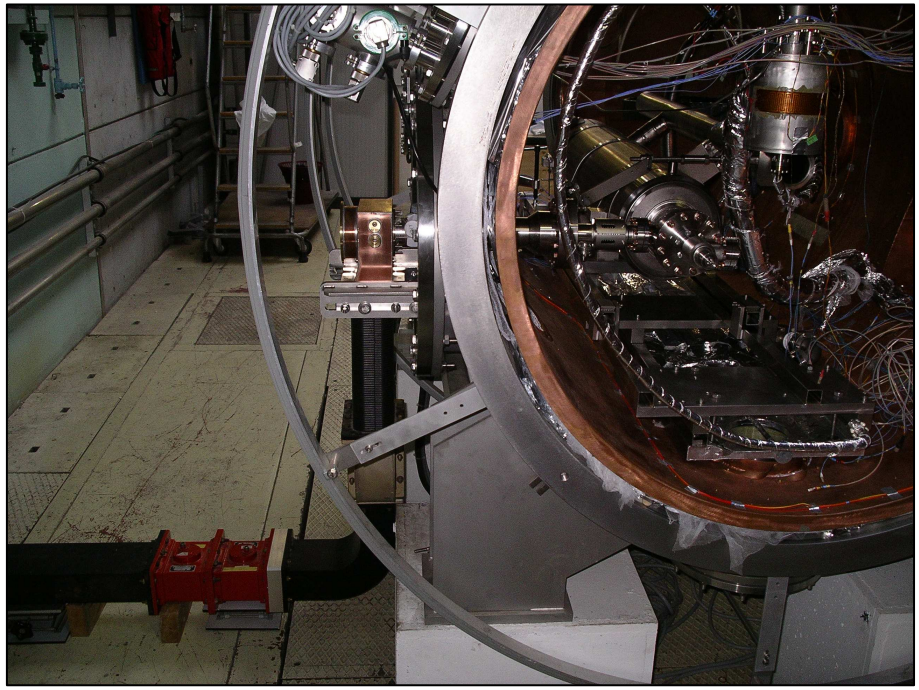
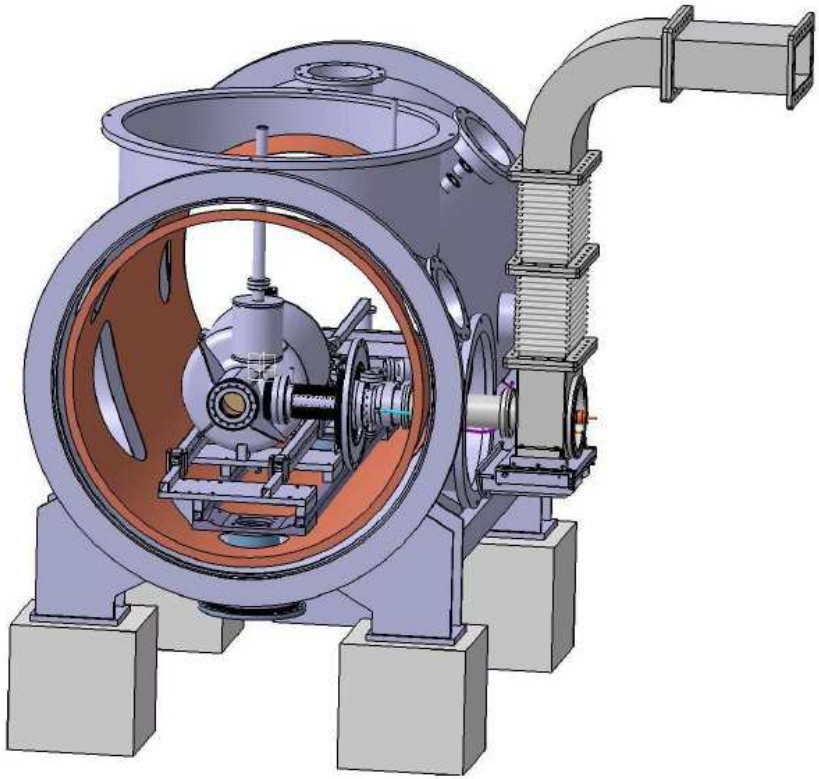
Possibility to test cavities at 1.3 GHz or 700 MHz

(separate RF power ports)





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Helium Cryogenic Plant (CryHoLab)

Gas Storage
(100 m^3)

1.7 K → pumping group
roots : 4 g/s @ 13 mb

Compressor
315 kW – 1600 m^3/h

Liquefier 140 l/h
Buffer tank 2000 l

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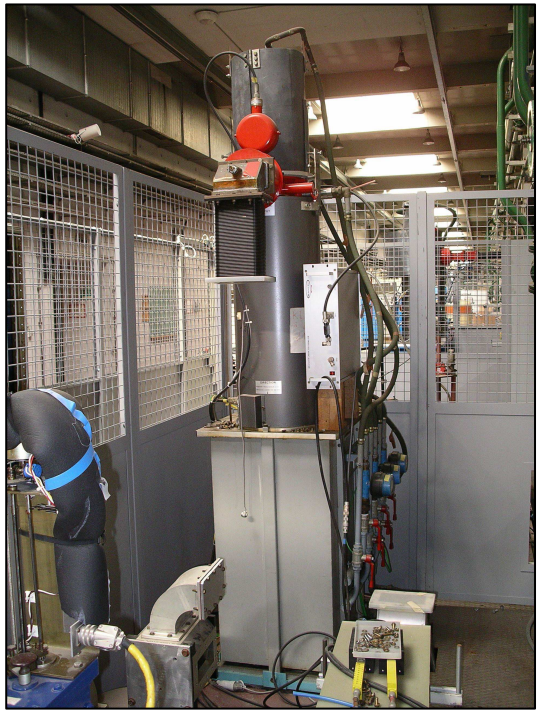
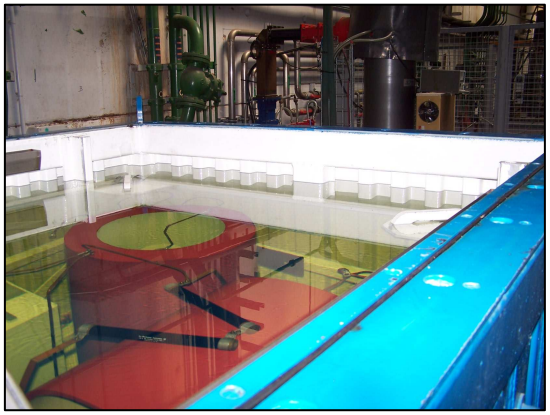
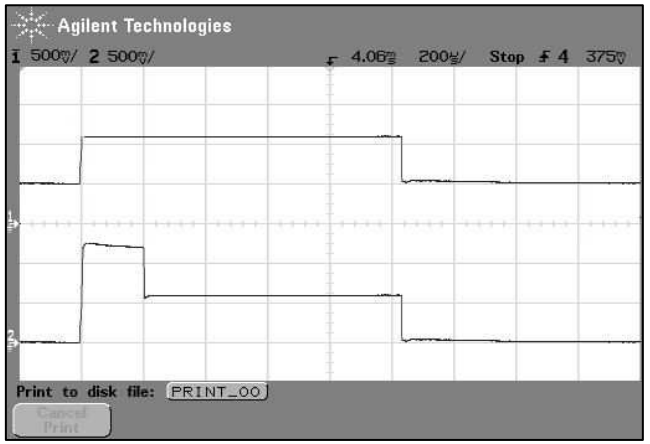
Pulsed RF Power (1.3 GHz)

Thales Klystron
1.5 MW - 1 ms – 10 Hz



Modulator (oil 4500 l)





RF power without or with pre-pulse
P (1ms) or 4P/P (200µs / 800µs)

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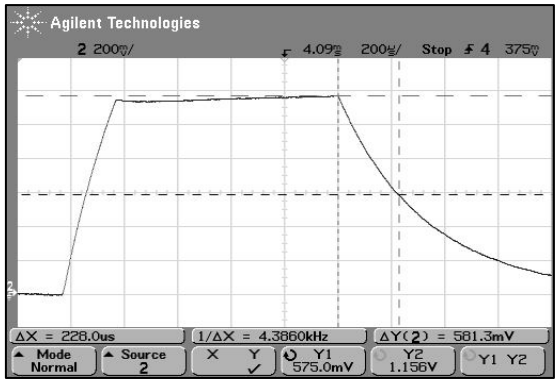
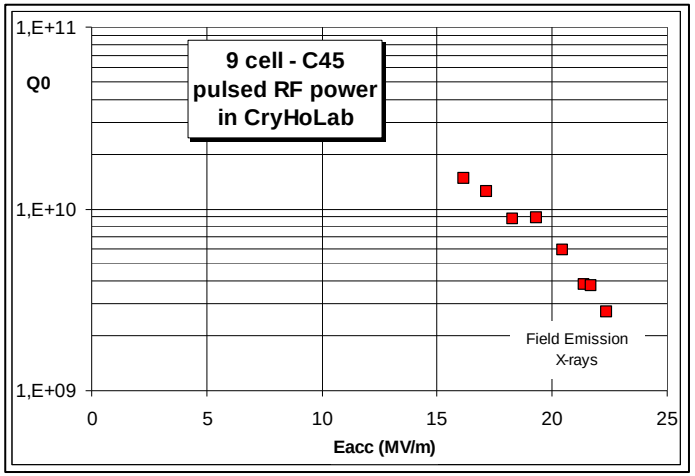
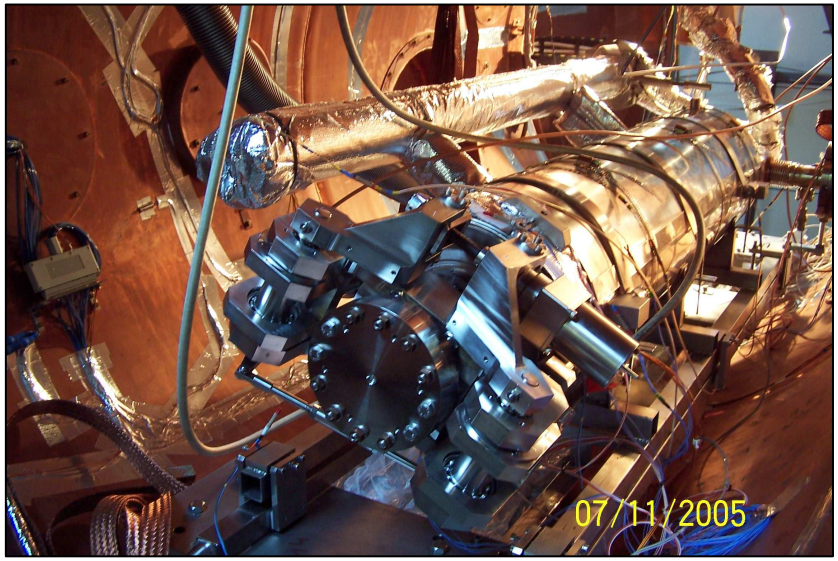
Test of 9-cell Cavity in CryHoLab

RF flat top on P_t





Pulsed RF Test @ 1.7 K



full equipped cavity (C45)
with TTF III coupler
and piezo cold tuning system

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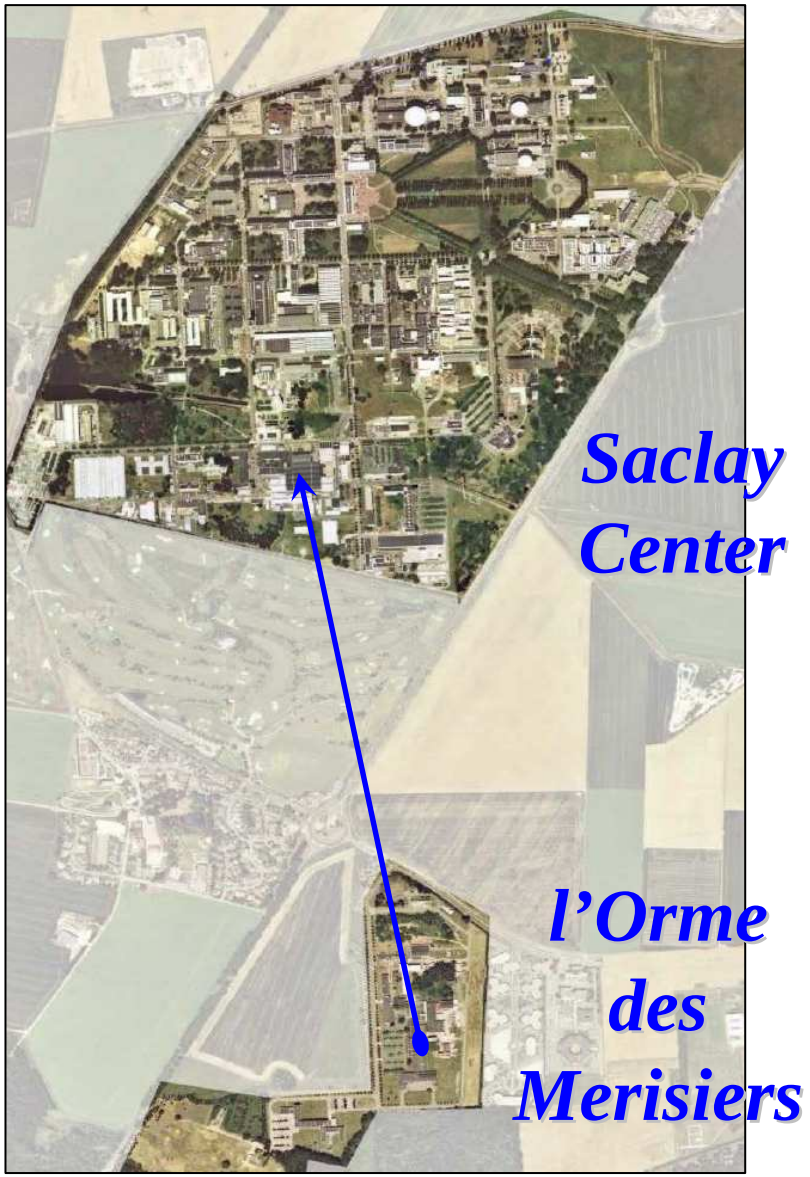
Facilities Transfer

First step : May – Dec. 2006

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

Second step:
mid 2007 ?

Chemistry
New Clean Room
(Spiral2 project)
28 → 53 m²



New Experimental Site

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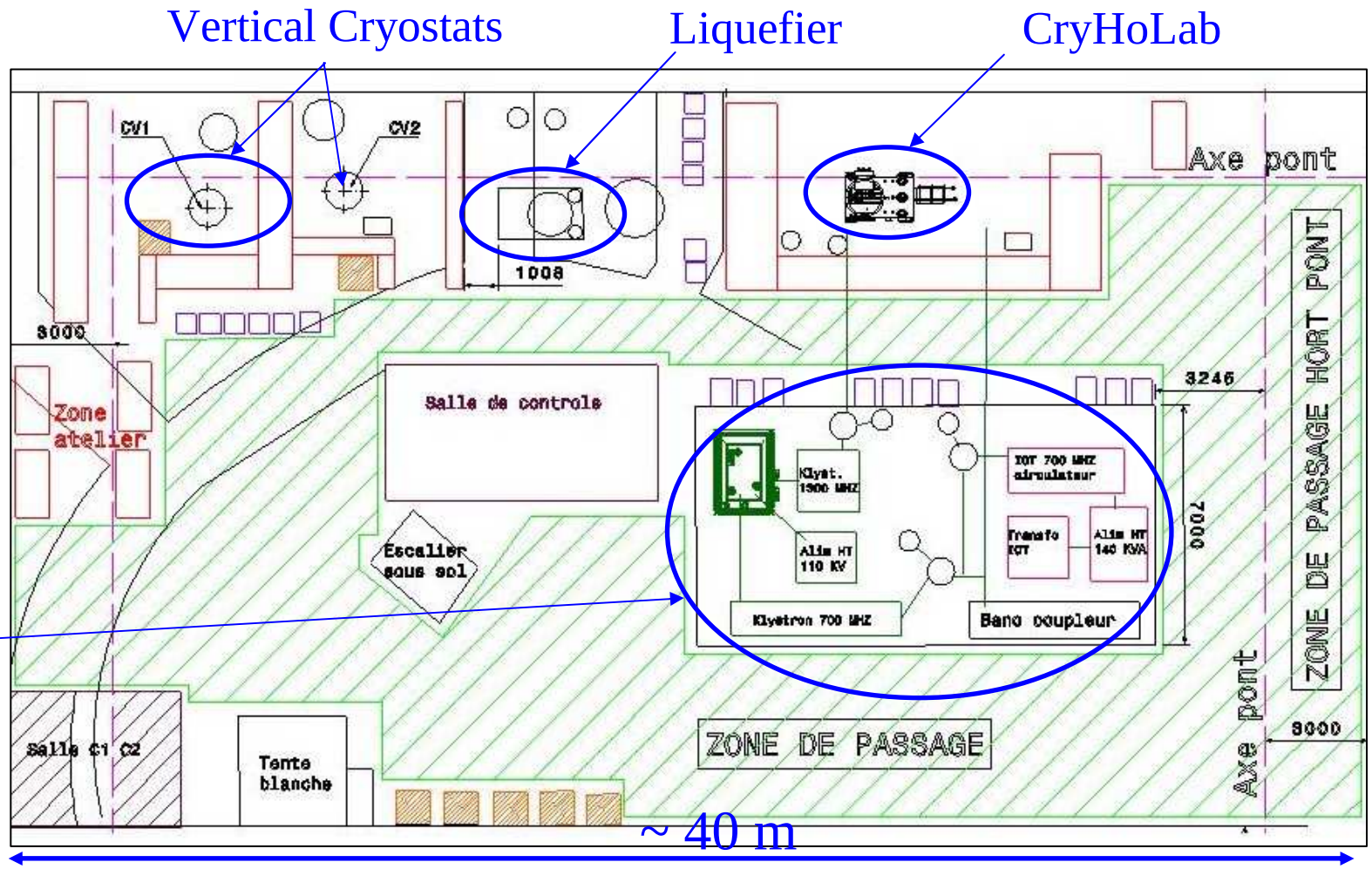
grouping together in same area



RF
1.3 GHz &
700 MHz