SPL cryomodule tests in SM18
RF power

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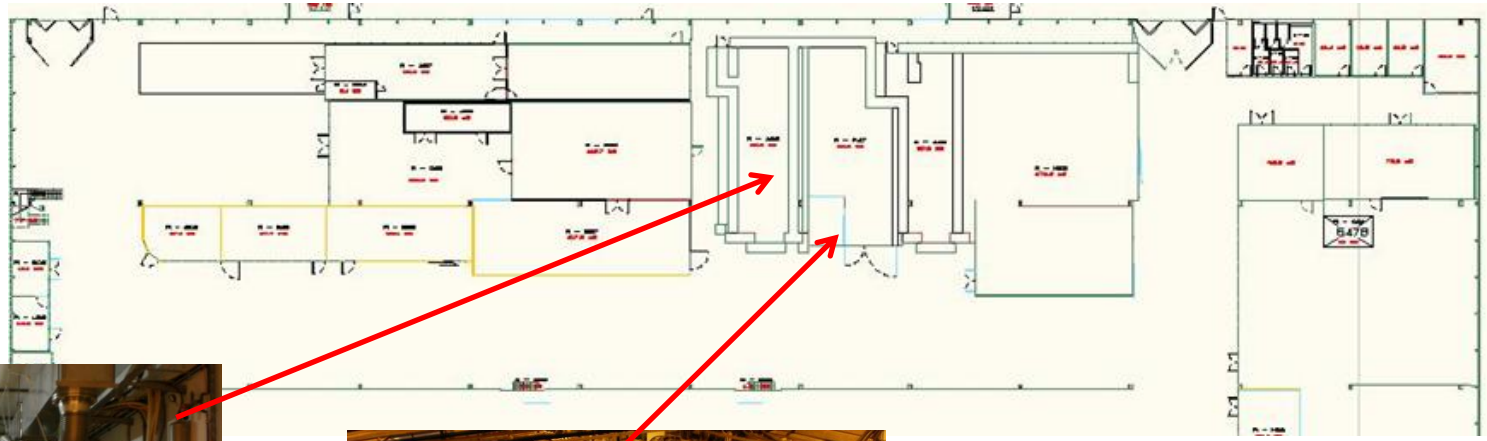
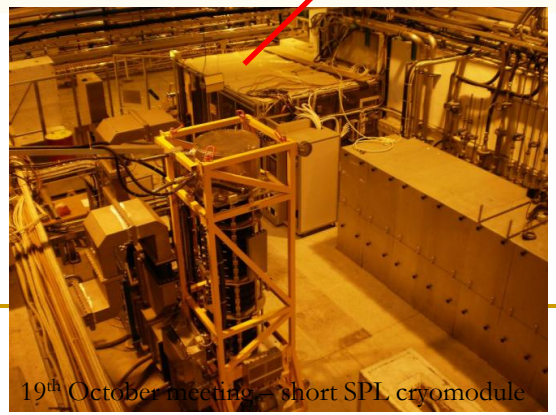
Scope of the presentation

- Existing infrastructures
- New equipment
- RF power distribution
- Planning

Infrastructure (1): bunker A

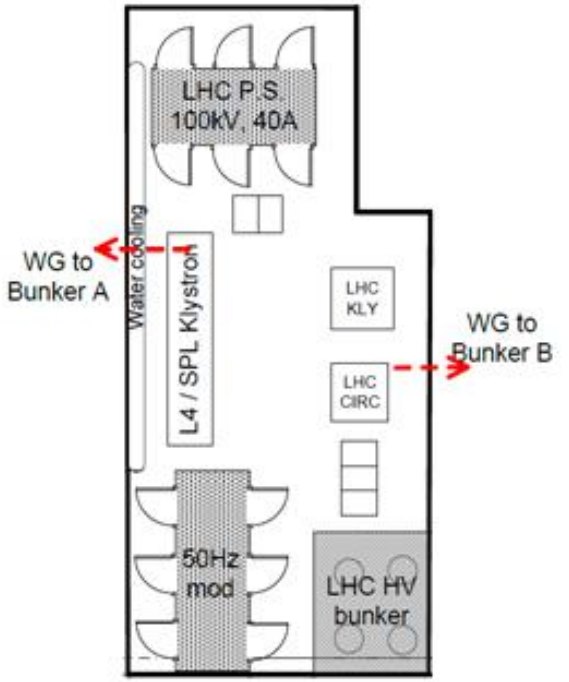
- SPL cryomodule tests will be done in SM18 bunker A
- Bunker A:
  - will be adapted for the Linac4 RF structure tests (2011 -> end 2012)
  - should be modified for 2K operation (cryoline replacement end 2011?)
  - must be ready for SPL cryomodule tests in 2013



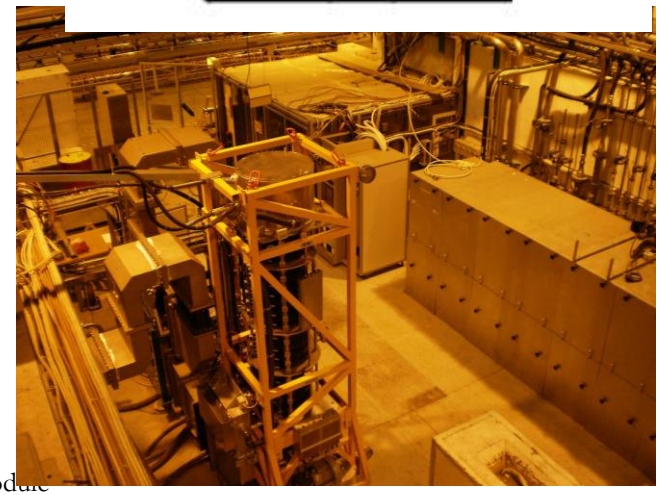


Infrastructure (2): high power zone

- High RF power zone:
  - Very crowded area:
    - 100kV, 40A PC
    - LHC high RF power
    - LHC HV bunker
    - 352MHz 1.3MW klystron (Linac4 tests)



- Upgrade towards L4 / SPL tests:
  - Built new LHC HV bunker to free space for pulsed modulator (Jan '11)
  - 2011: installation of a 2Hz Linac 4 type modulator
  - 50Hz modulator
    - integration: footprint??
    - HV interface with klystron shall be identical to L4 modulator
      -> under study
  - Specify & built new (slow) control system (PLC, interlocks)
    - power control -> 2011
    - cryostat & cavity control -> to be defined and built!

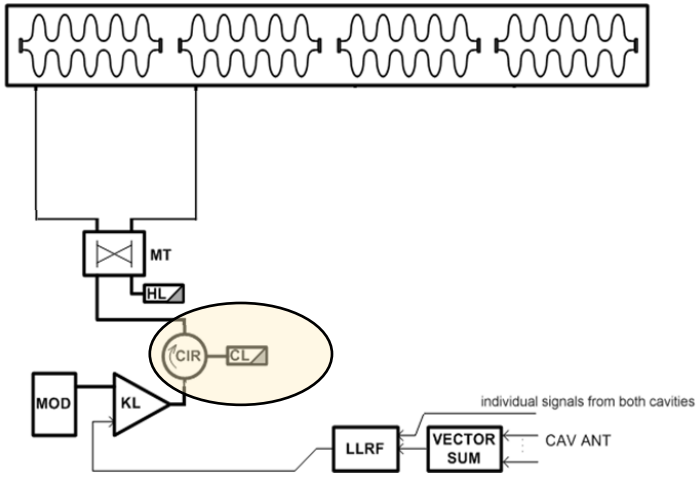


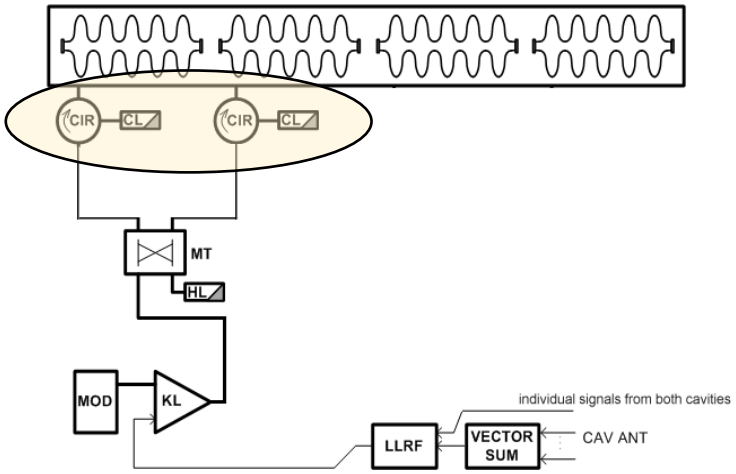
- Schedule:
  - L4 test place shall be ready by April-May 2011
  - L4 tests until end 2012
  - 704 MHz equipment installation: end 2012

What specific RF equipment do we need?

- 50 Hz modulator (Scandinova)
  - Urgent: footprint
  - Delivery schedule?
- 704 MHz klystron
  - specification document ready…see next slides
  - HV interface compatible with Linac4 (2Hz) modulator -> ok with Scandinova?
- 704 MHz drive amplifier
- 704 MHz circulator with its RF load
  - specification document being prepared
- WR 1150 waveguide system
  - straight sections, bends, magic T,
  - directional couplers
- Cryomodule slow control system (plc, interlocks, etc)
  - Cryo: give full responsibility of cryo control to cryo team, to be checked!
  - RF: - Define interface with existing SM18 systems/activities and Linac4 type control
    - Check compatibility with of interlocks for 50Hz operation

RF power distribution:





What is the purpose of the SM18 test place?

- condition and test the cavities up to 25MV/m?
+ test & validate a choice for power distribution system? including the LLRF system?

=> impact on klystron specs, in particular for:

- rated output power => 1MW or more?
- operating point (-1.5dB below saturation)
- frequencies of bunching cavities
- bandwidth
-…

SPL – high power planning

	2010			2011				2012				2013
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
SM18 - 2K Vertical Cryostat		operational			new LHe line							
SM18 - 2K Bunker						**new control system**		New LHe line				
704MHz RF power		specs ready			orders					installation		
50Hz modulator			Footprint/dim								installation	
High power test place			integration				modification				**controls**	
Clean rooms upgrade			study?			upgrade?						

LHC OPERATION | **LHC SHUTDOWN / STARTUP**

LINAC 4 EQUIPMENT TESTS

LINAC4 INSTALLATION

HIE ISOLDE CAVITIES & CRYOMODULES

Other controls activities

- **Linac 4 RF control production and test** | **Linac 4 RF control installation**
- **SPS 800/200MHz Control renovation**
- **PS booster RF cavities Control renovation**