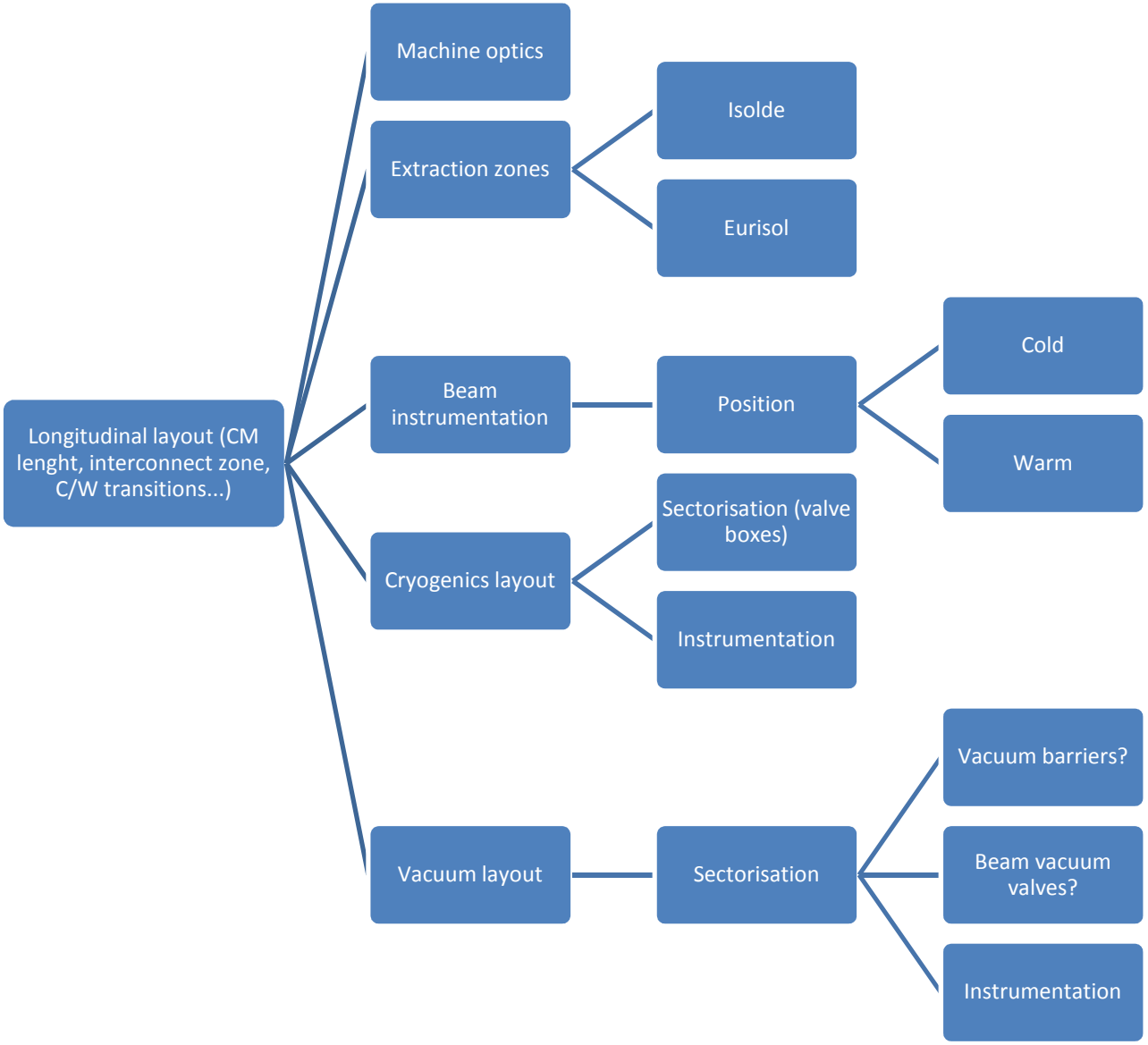
SPL cryomodule general parameters/design

(relevant to this workshop)

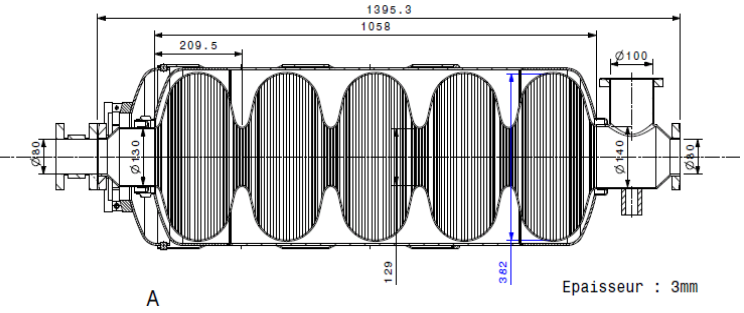
Vittorio Parma

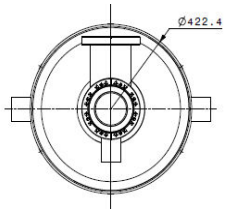
Mini-workshop on Mechanical issues SPL cavities/cryo-modules,
CERN 30th September 2009

Conceptual design:
some ingredients towards a longitudinal layout



Cryo-module
longitudinal integration study (β=1)





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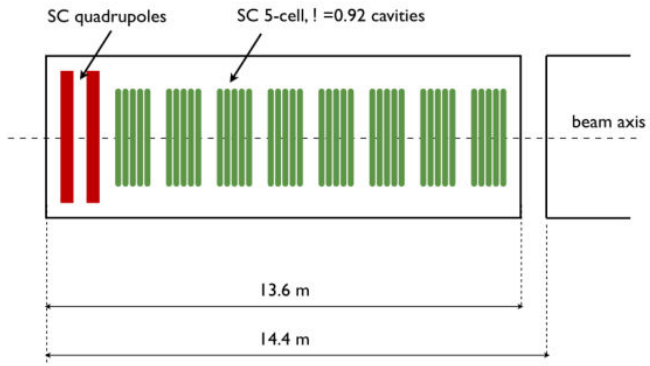
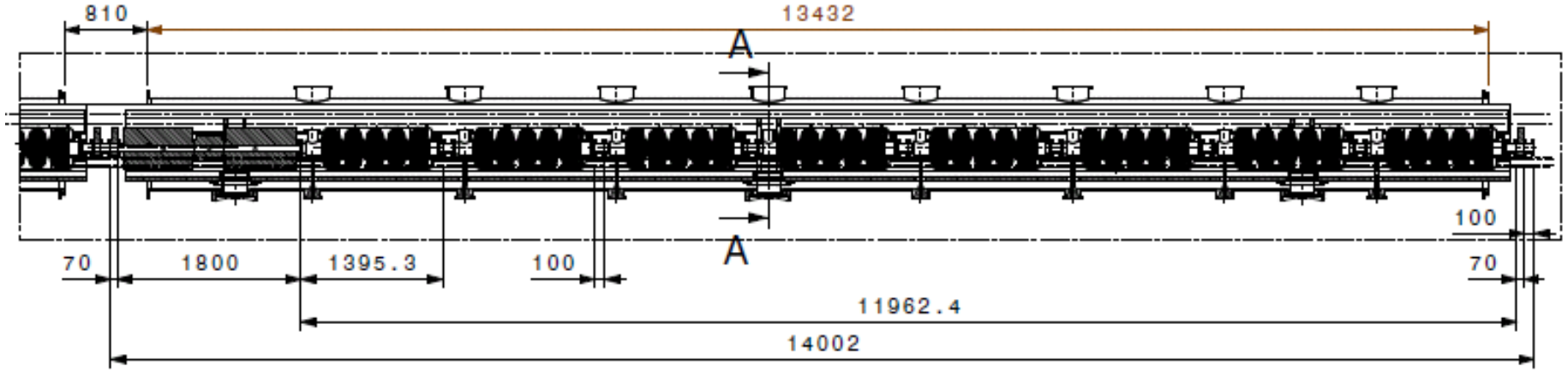
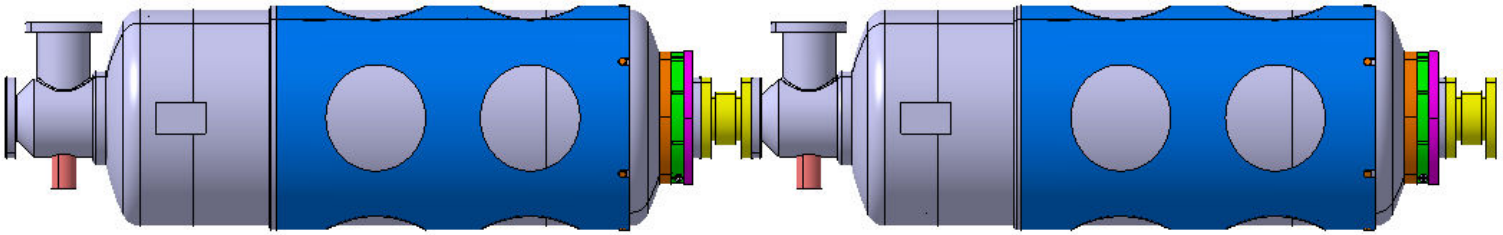
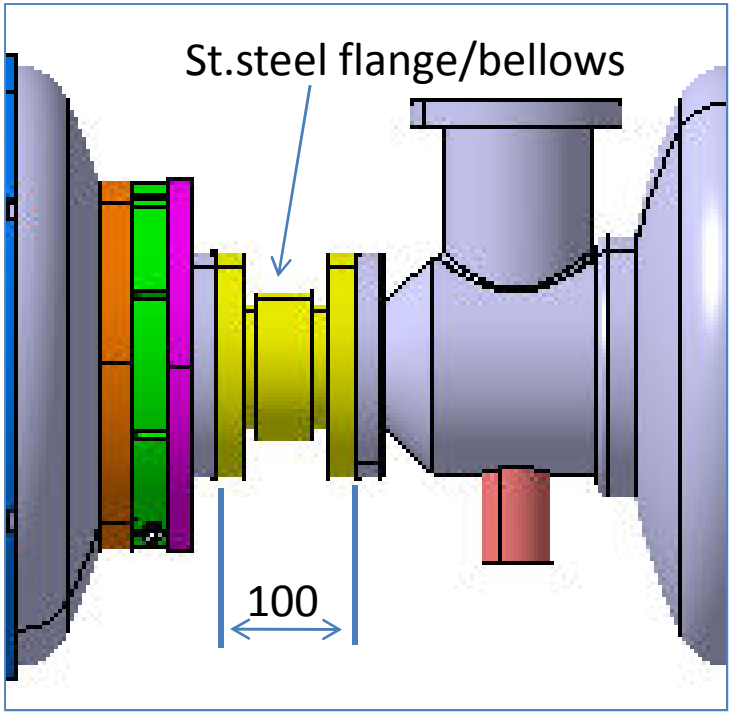


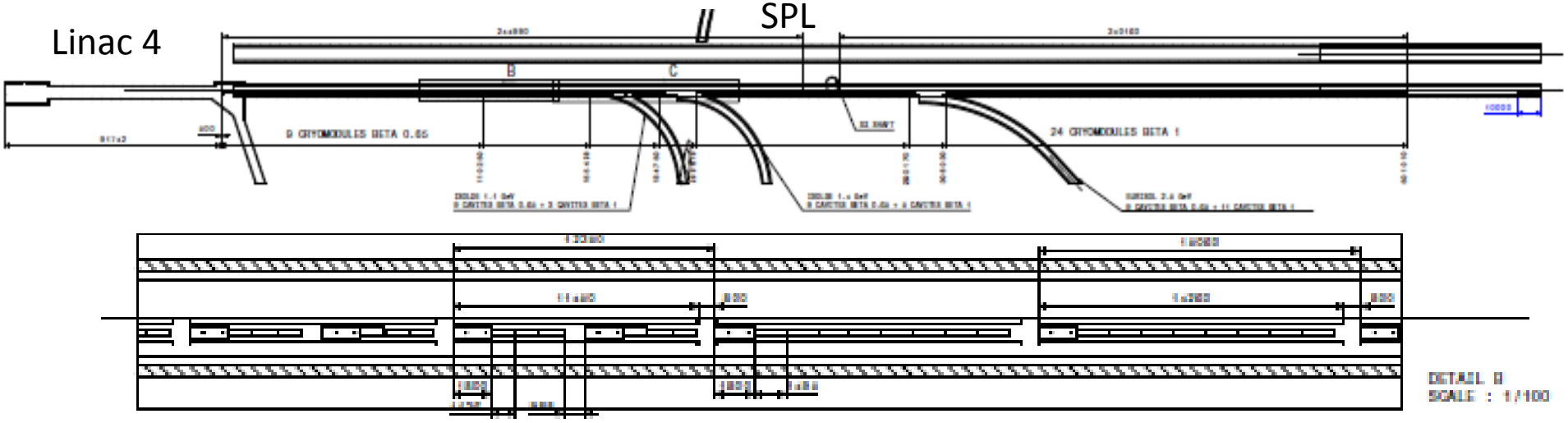


Inter-cavity interconnect

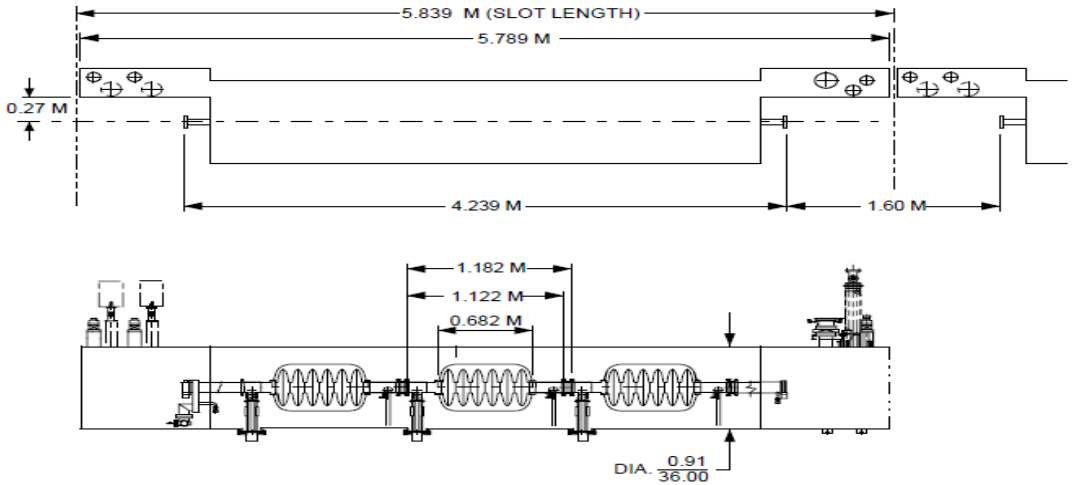




Layout studies: continuous vs.segmented cryostat ?



Continuous cryostat option



Segmented cryostat option, with cryo distribution line (SNS example)

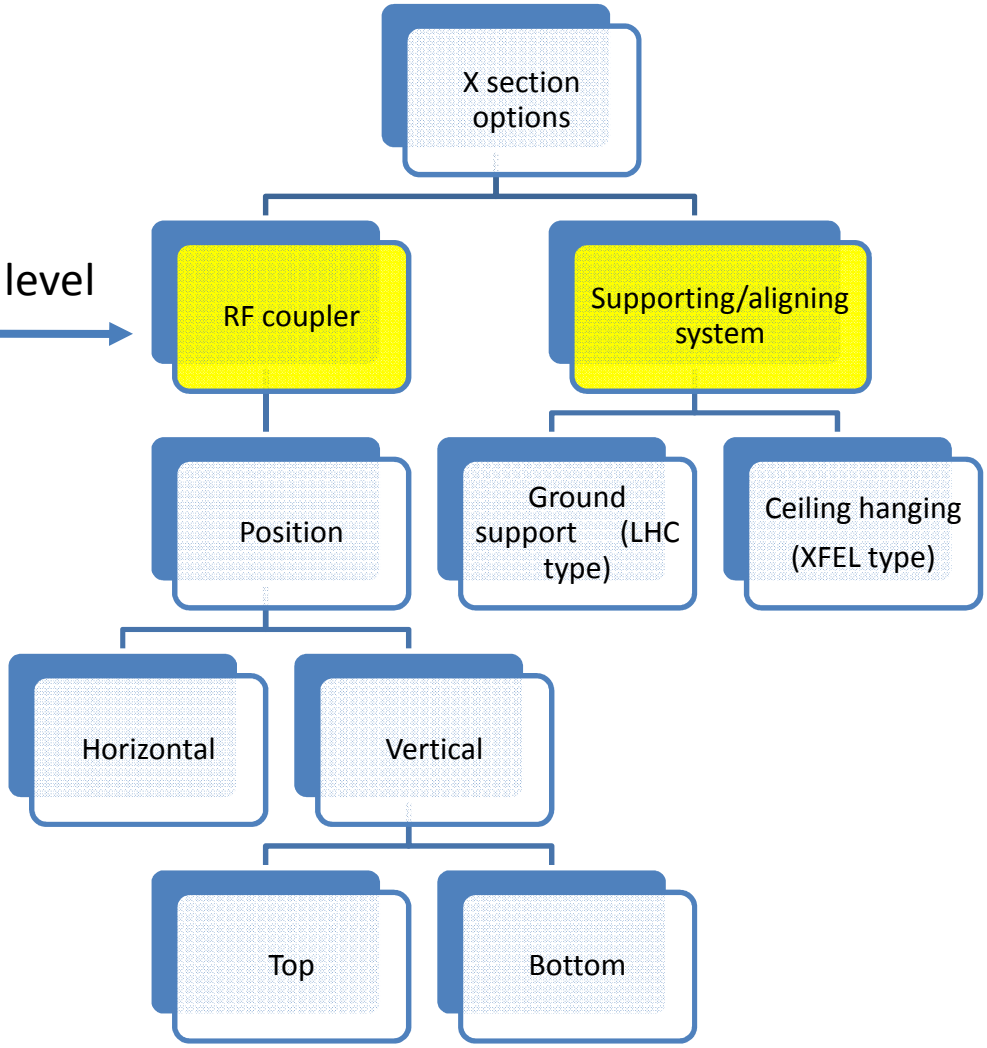
Layout studies: continuous vs.segmented cryostat ?

	Continuous	Segmented
Pros	- Shorter linac (in principle) - Integrated cryo distribution possible - cryo control on long strings → less controls and instrumentation - ...	- Short intervention for repair (with sectorisation valves) - Warm magnets possible→ simpler cryomodules, upgrades of focusing schemes possible - ...
Contras	- Long intervention for repair (complete warm up) - cold quads (not strictly necessary by requirement), - "bridging" of warm zones for warm instrumentation and beam extractions - ...	- Longer linac (in principle) - cryo distribution line necessary -...

→ **9-10 November 2009: Workshop on Cryogenic and Vacuum Sectorisations of the SPL at CERN**

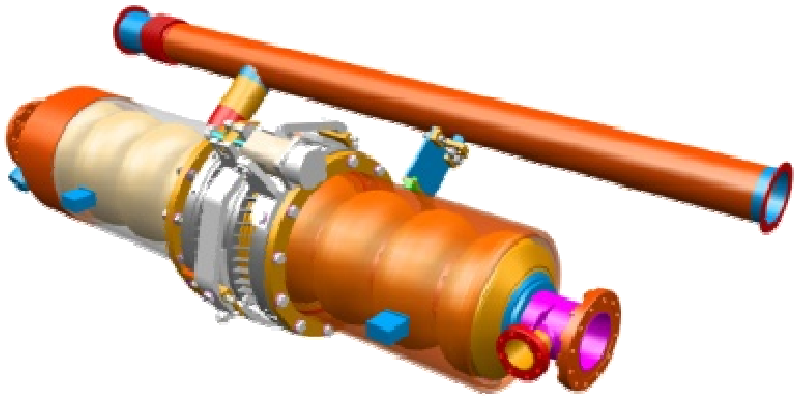
Conceptual design:
X section options under study

Components/system level



Interfaces
dressed cavity to cryomodule

Item/function	Interface need	Input
Supporting/sliding system	Mechanical interface	depends on cryo-module design
Bi-phase pipe connection	Size, position, material	cryogenic cooling of dynamic HL, He vessel & cryo-module design
He filling line	Size, connection type (flanged? welded?) bottom position,	Cool-down/warm-up, cryomodule assembly
RF Coupler	Mechanical interface	RF coupler and cryo-module design
Tuner (CEA design)	Integration space, feedthrough	Tuner design
Operating/design pressure	Values, stability (microphonics)	Cavity/helium vessel/tuner design
Other?	...	...



ILC example