

Modification of the LEB Layout

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Low-Energy Branch Workshop, GSI, 23.11.2006

- **Super-FRS layout and buildings (FBTR)**
- **Changes in the LEB**
- **LEB Experimental Cave**
- **Roadmap of Civil Construction**

Super-FRS Layout (FBTR 03/2006)

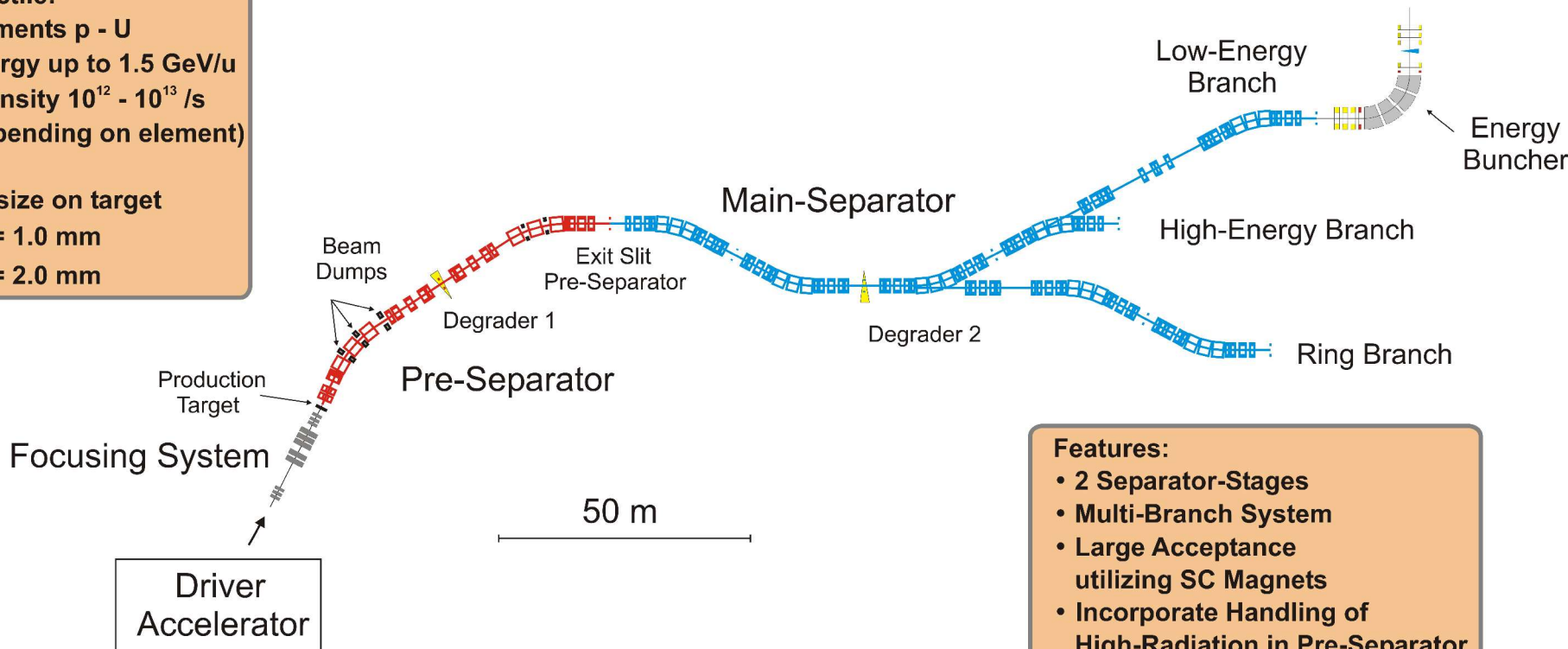
Projectile:

- Elements p - U
- Energy up to 1.5 GeV/u
- Intensity $10^{12} - 10^{13}$ /s (depending on element)

Spot size on target

$$\sigma_x = 1.0 \text{ mm}$$

$$\sigma_y = 2.0 \text{ mm}$$

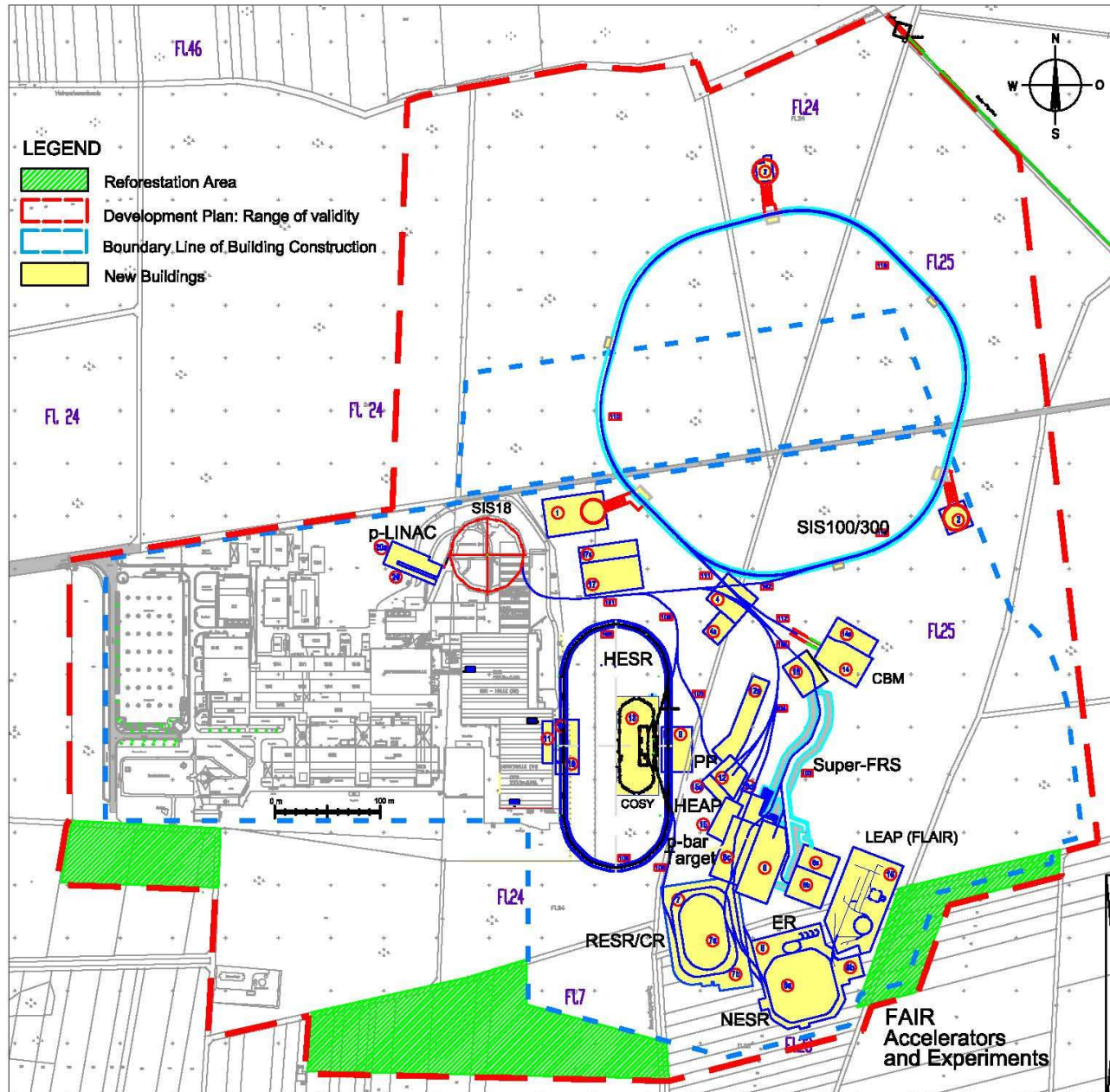


Features:

- 2 Separator-Stages
- Multi-Branch System
- Large Acceptance utilizing SC Magnets
- Incorporate Handling of High-Radiation in Pre-Separator



Topology of FAIR (FBTR 03/2006)





FAIR Baseline Costs

D. Krämer, 17.10.2006

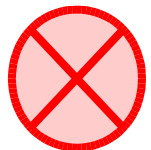
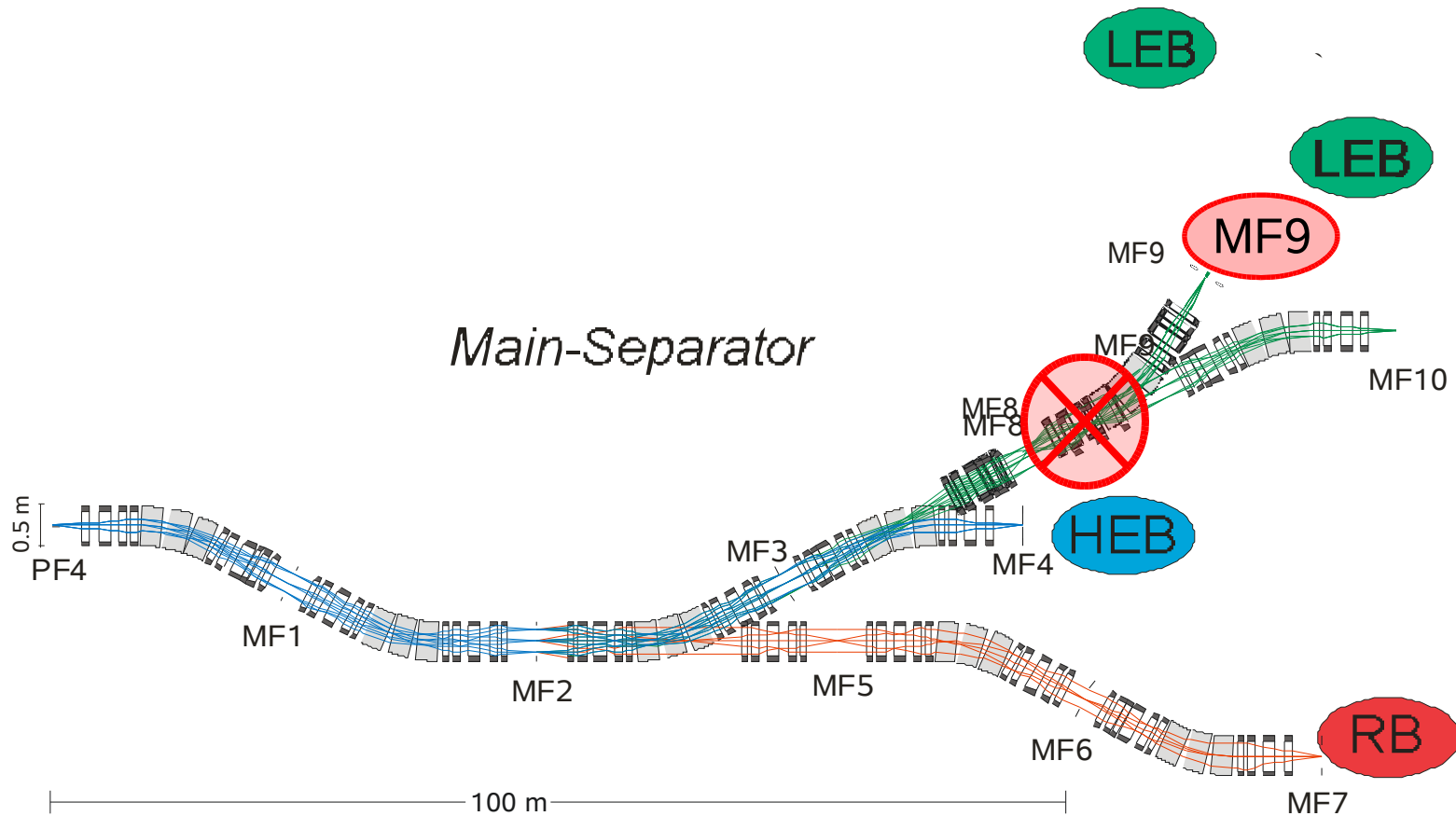
CORE Evaluation
and TAC recommendation

	(M€)
Accelerators	533
Baseline Experiments (incl. Super-FRS) **	180
Buildings & Supply Systems	289
Total Investments	1002
Manpower (2400 MY)	185
Total Project Construction Cost	1187

75% of construction cost from Germany, 25% from member states
Operation costs shared among member states



Main Separator with Compact LEB (Cost Reduction)



1 QT+Hex

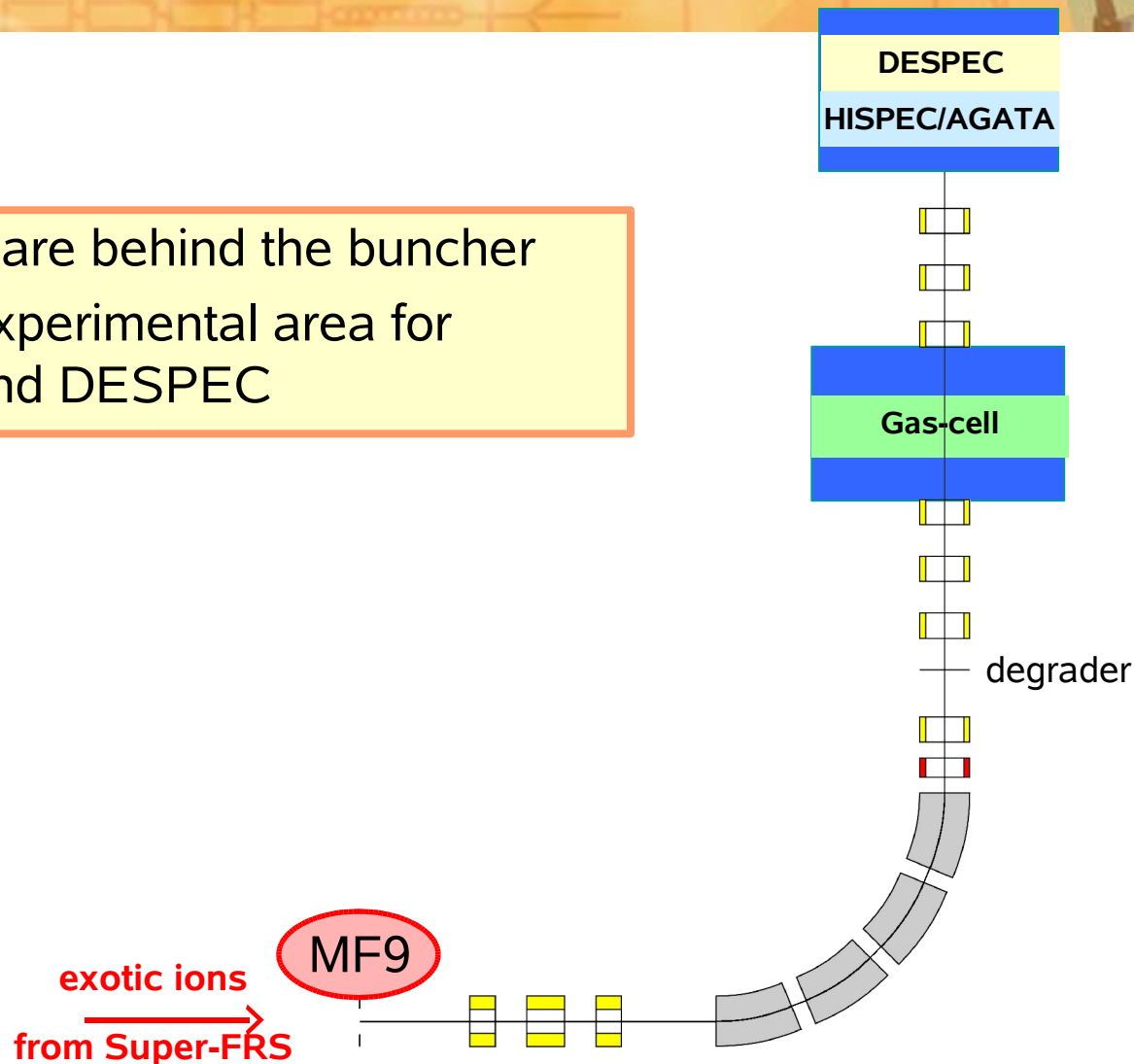


Topology LEB Cave



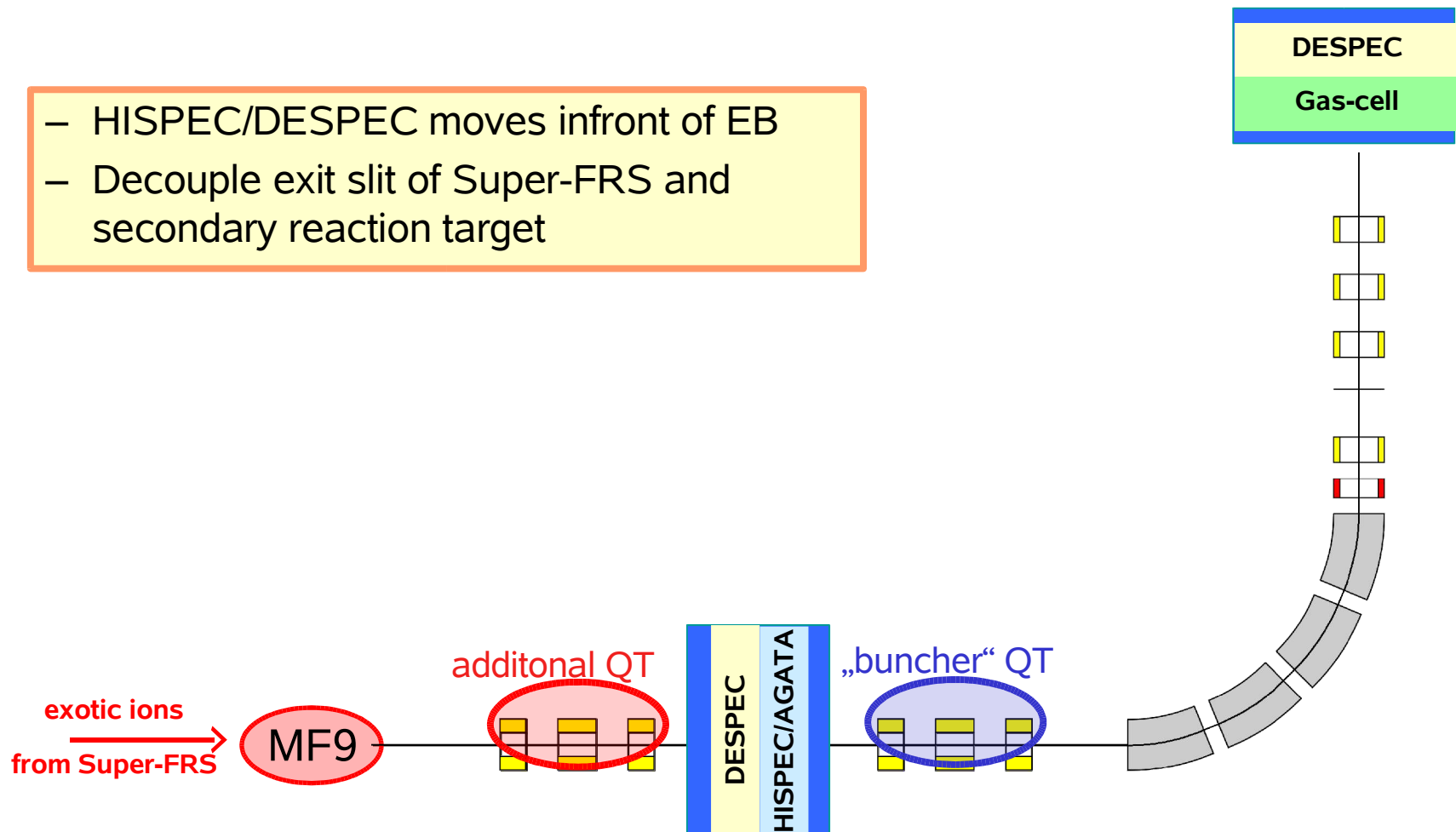
FBTR Layout of the Low-Energy Experimental Area

- all set-ups are behind the buncher
- only one experimental area for HISPEC and DESPEC



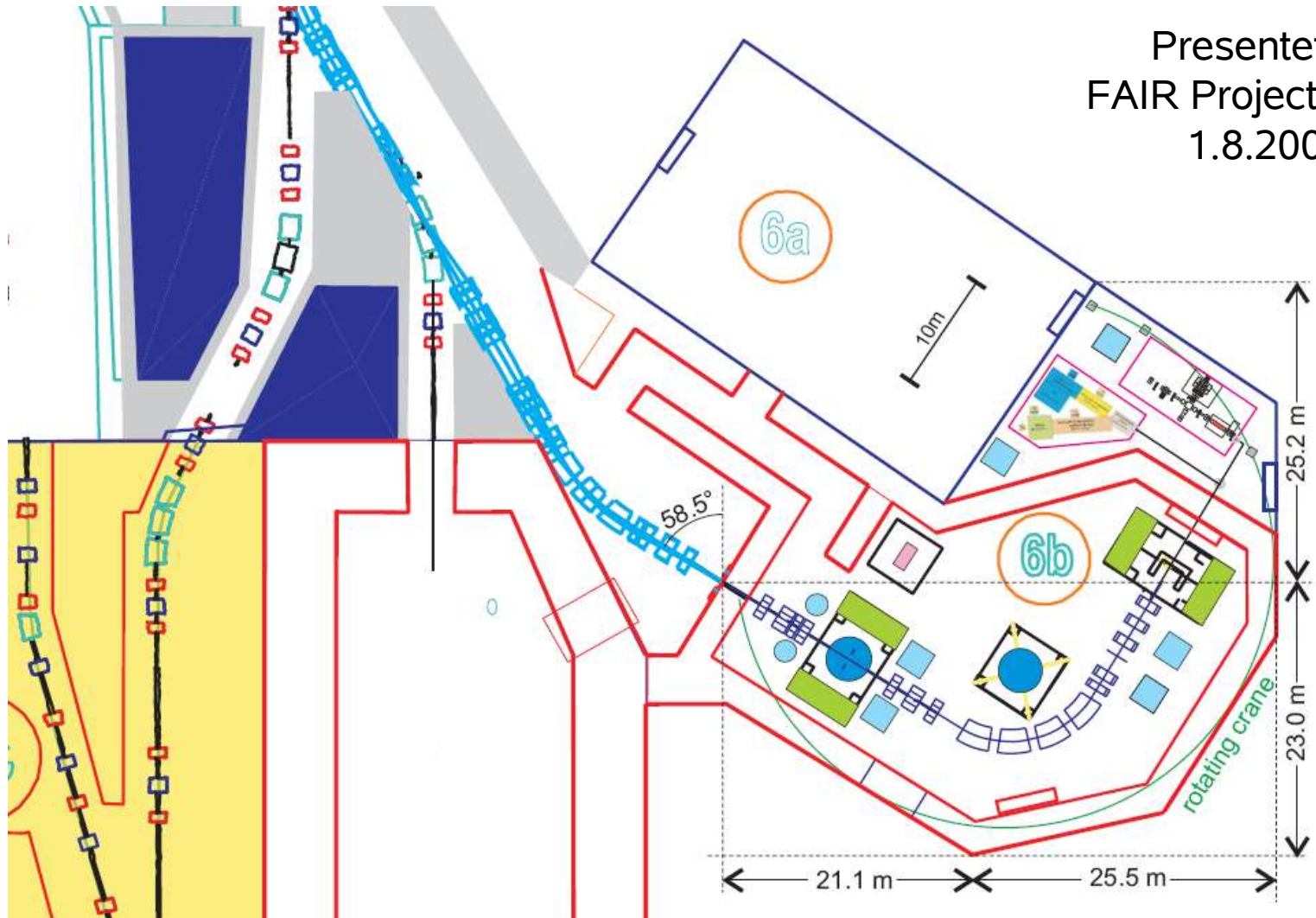
Proposed Layout of the Low-Energy Experimental Area (July 2006)

- HISPEC/DESPEC moves in front of EB
- Decouple exit slit of Super-FRS and secondary reaction target



Proposed Topology of July/August 2006

Presentet to
FAIR Project Office
1.8.2006



Cost & Space Ballance between FBTR and Proposed New LEB Design

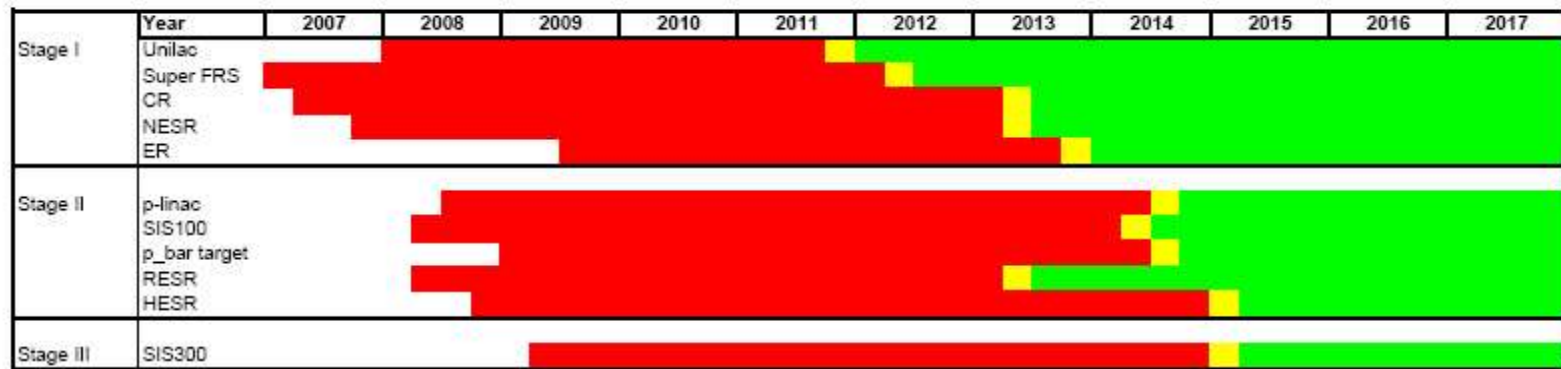
Investment	FBTR, Feb. 2006		Plan, 31. July 2006		Difference
		Costs [M€]		Costs [M€]	Costs [M€]
Telescope between MF8 and MF9					
- Magnets (Multiplet)	3xQuad, 2xSext	1,4	-	0,0	-1,4
- Focal plane equipment	Chamber, Vac, Detect.	0,2	-	0,0	-0,2
Energy buncher and experiments					
- Energy buncher	complete system	8,7	same as FBTR	8,7	0,0
- HISPEC Spectrometer	ALADIN like	3,5	integrated in EB function	0,0	-3,5
- HISPEC Focusing	-	0,0	3xQuad in addition	1,1	1,1
Crane (10 ton)	straight overhead crane	0,1	rotating overhead crane	0,2	0,1
Sum		13,9		10,0	-3,9

Floor Space	FBTR, Feb. 2006		Plan, 31. July 2006		Difference
		Area [m2]		Area [m2]	Area [m2]
- telescope (FAIR building 103)	10 * 7 m2	70,0	-	0,0	-70,0
- energy buncher (FAIR building 103)	30 * 7 m2	210,0	integrated in FAIR 6b	0,0	-210,0
- experimental hall (FAIR building 6b)	30 * 36 m2	1080,0	pentagonal	1420,0	340,0
Sum		1360,0		1420,0	60,0



Time Schedule

D. Krämer, 17.10.2006



Construction

Commissioning

Operation

Based on Civil Construction Schedule

First experiments scheduled for beginning of 2012 (Super-FRS) – Phase I
End of project scheduled for beginning of 2015

Schedule determined by civil construction progress



Roadmap: Accelerator and Civil Constuction

