



IFR
100 mm increased IFR, study

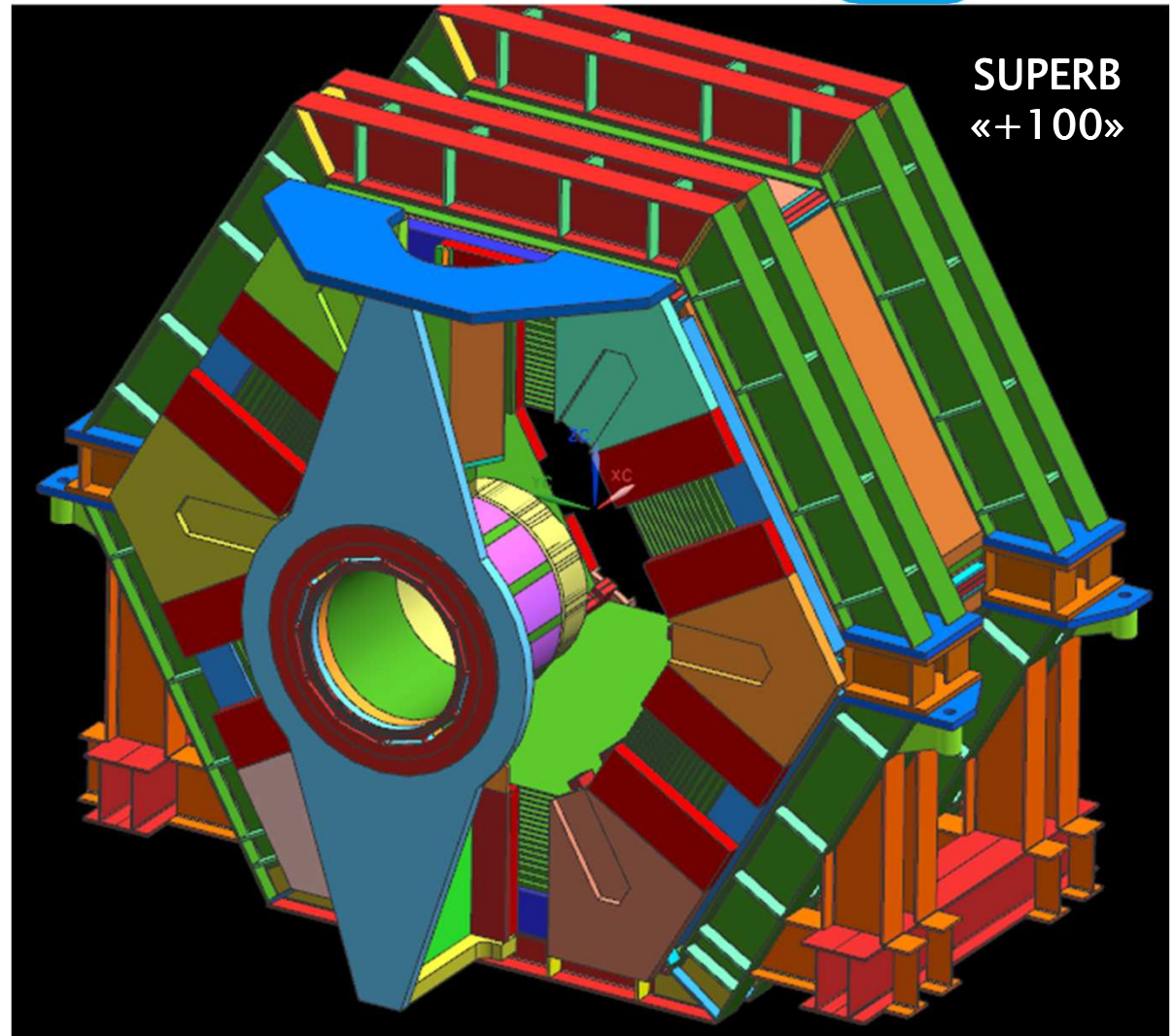


100 mm increased IFR, a study (BARREL ONLY)

Current baseline:
IFR recycling + modifications
to get cheap but «comfortable»
solution

«comfortable»:
IFR thickness comparable to
CDR layout: 920 mm

«+100mm» hypothesis:
add 100mm slab «on top» the
outer wedges, in order to reach
required IFR thickness



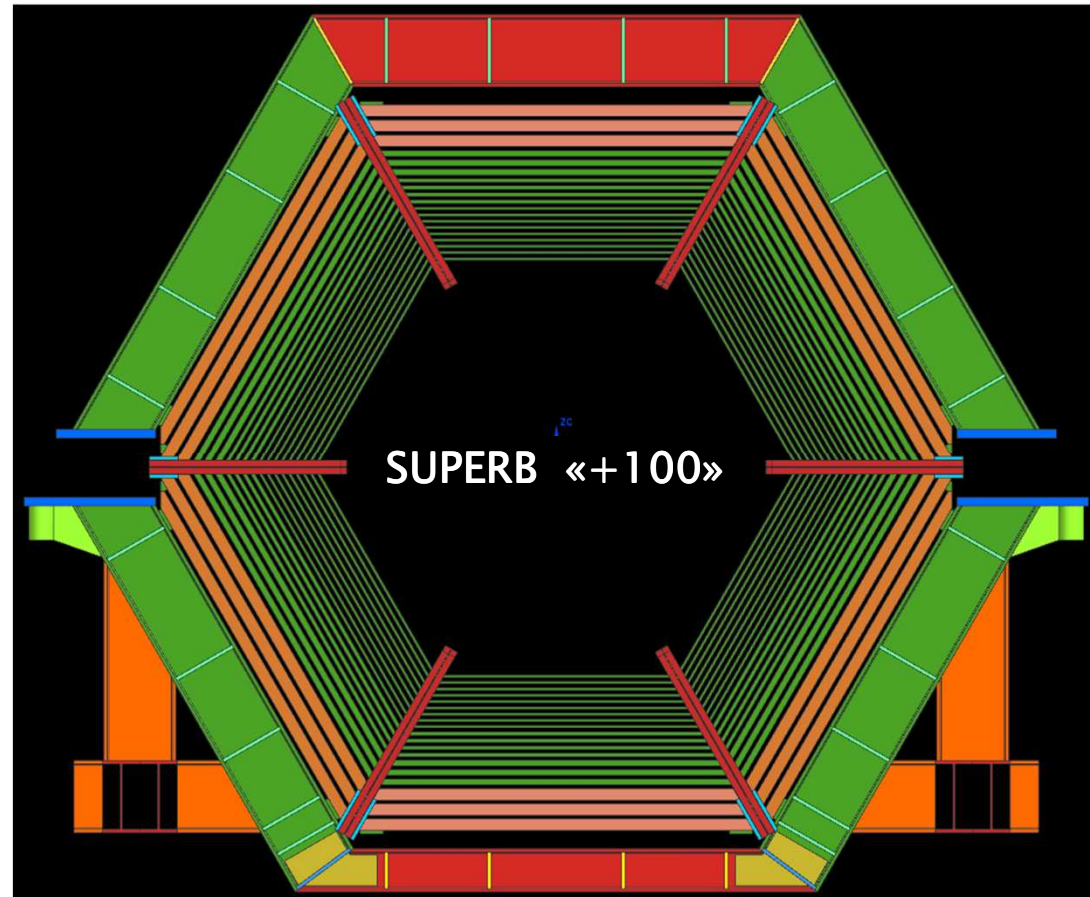
SUPERB
«+100»

Advantages in reusing the Babar barrel IFR:

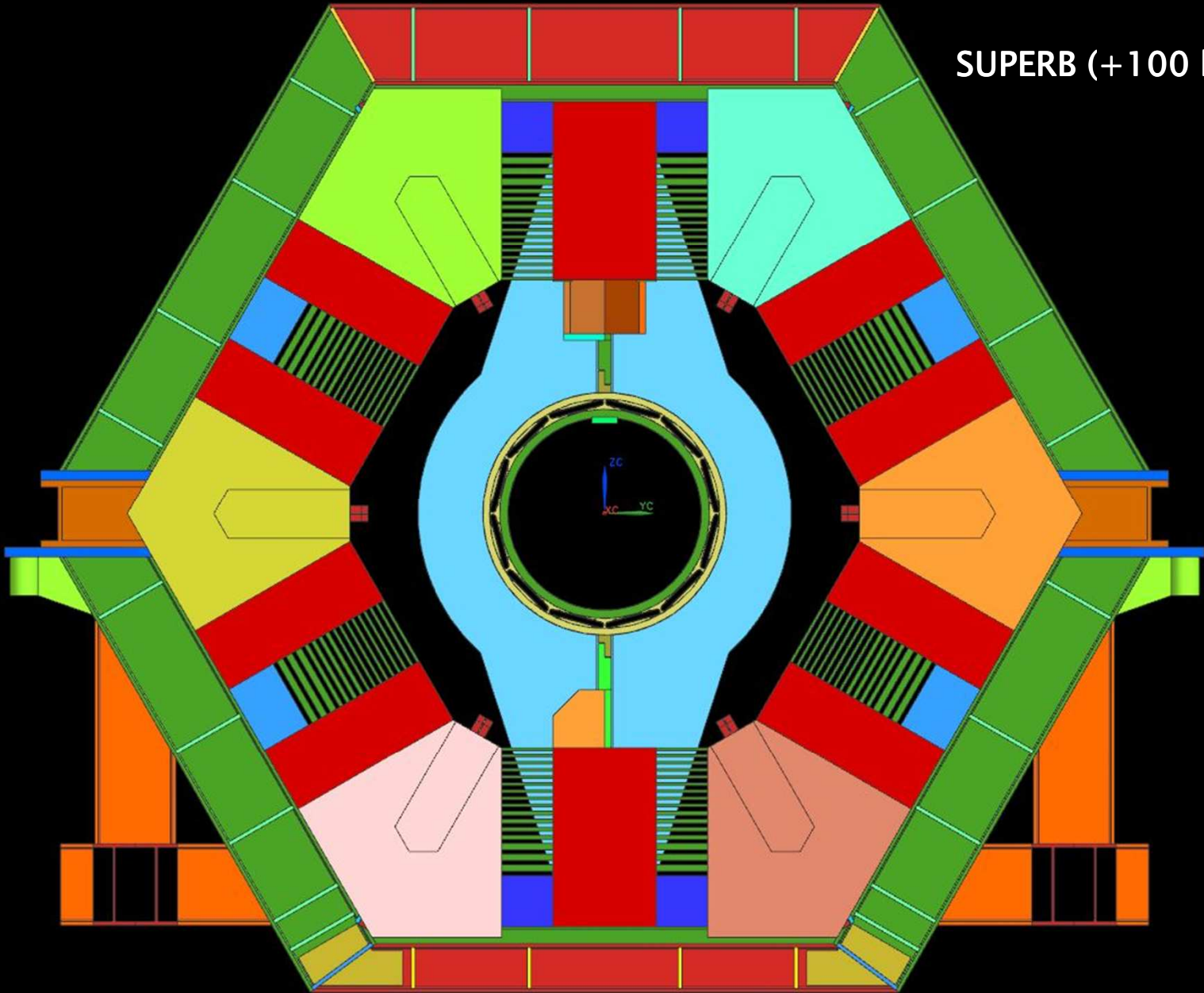
- About 360t of iron wedges available, + cradle&arcs
- About 70t of brass available (means about 135 mm of filter)

Disadvantages:

- inner wedges too «empty», low filter capacity
- Requires (brass) filling
- All main parts (wedges, cradle, arcs) need modifications
- Transportation



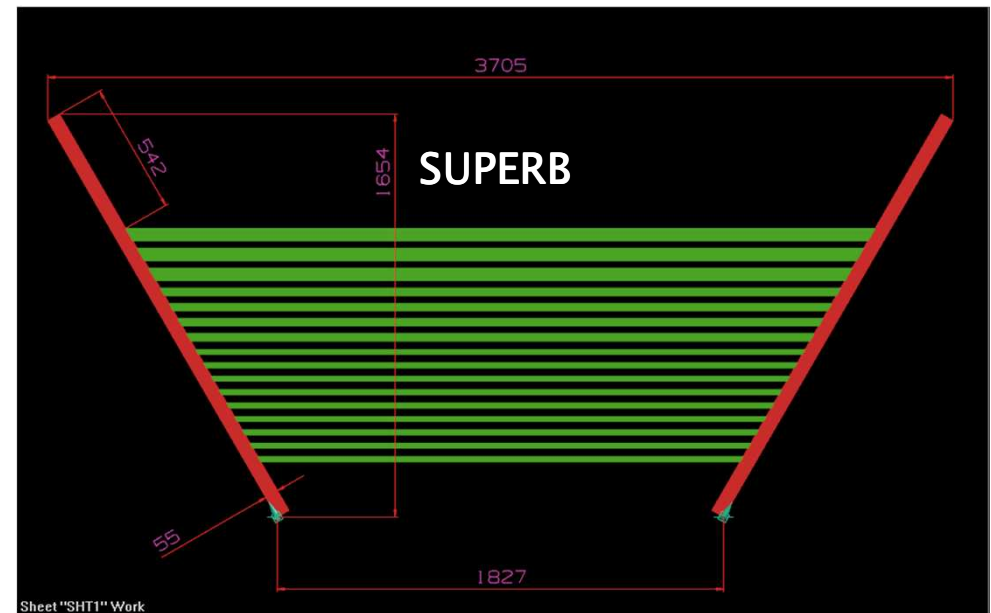
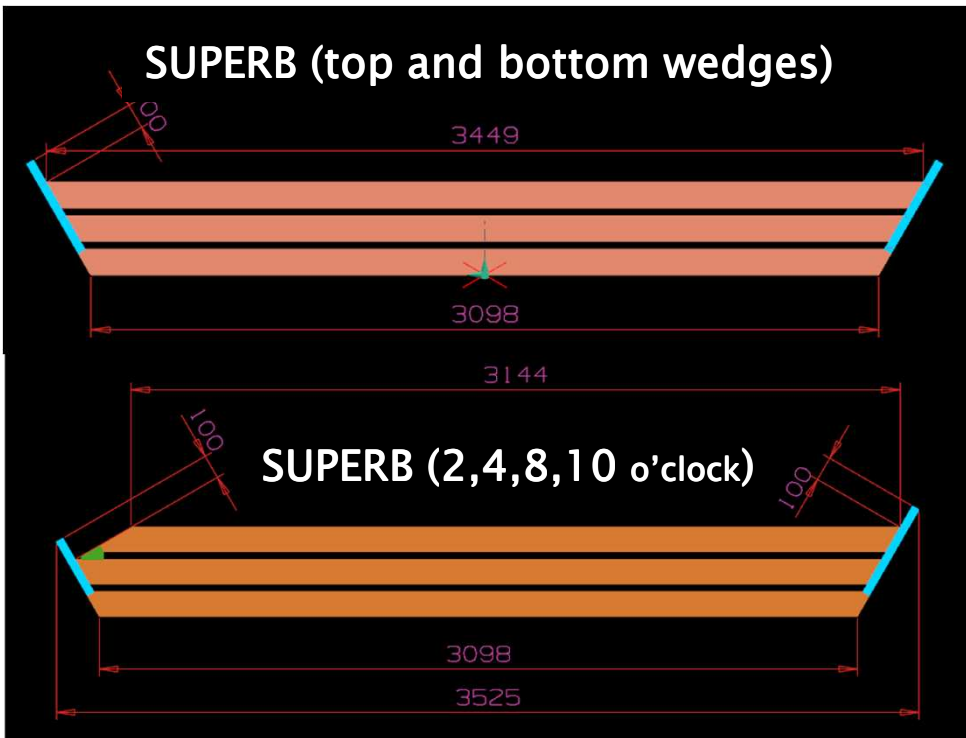
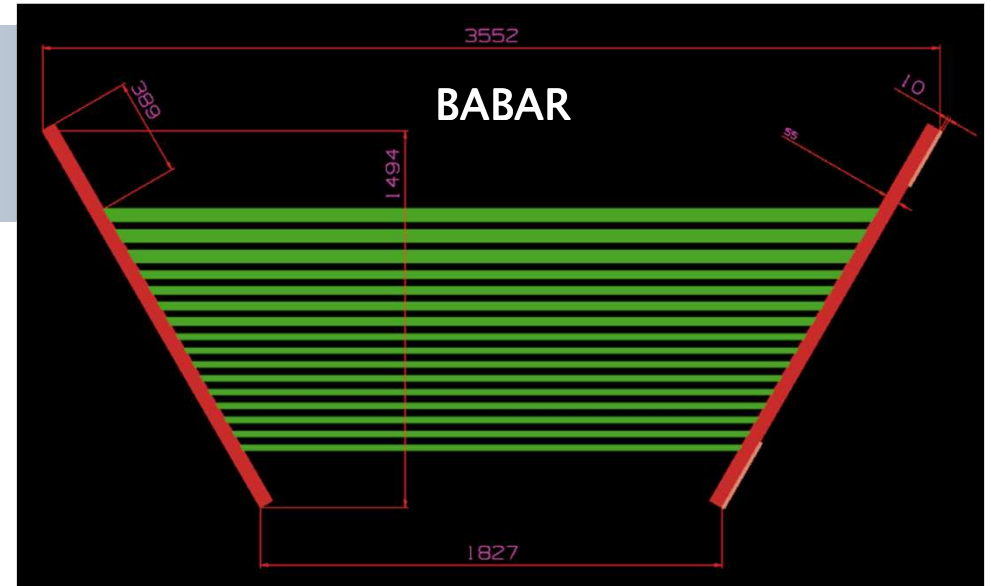
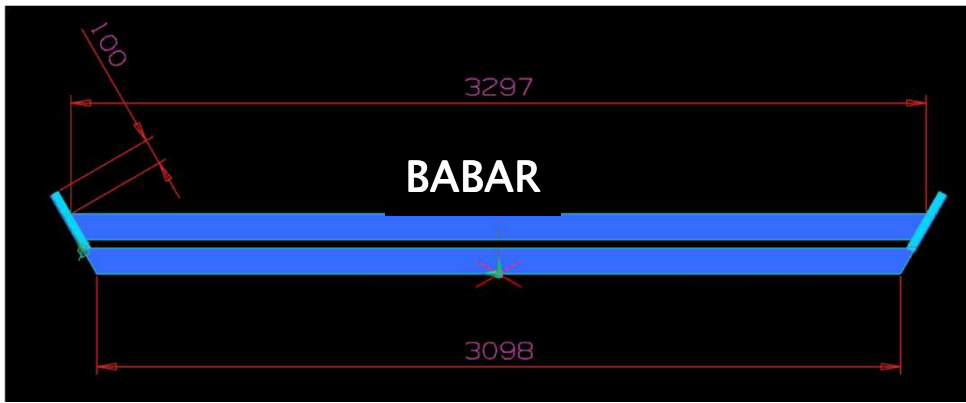
SUPERB (+100 hypothesis)



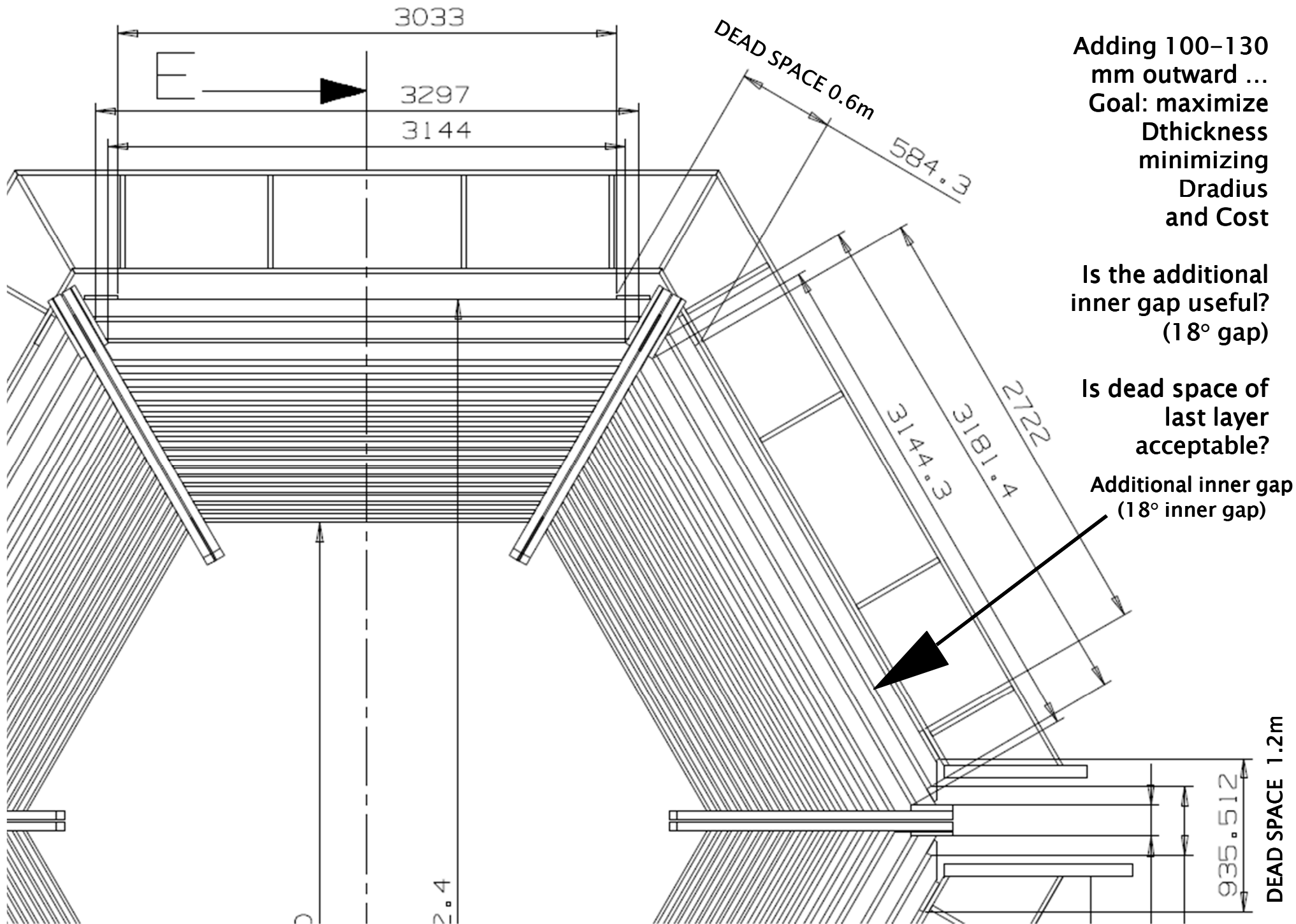
TOP WORK

2011/04/04

Massimo Benettoni



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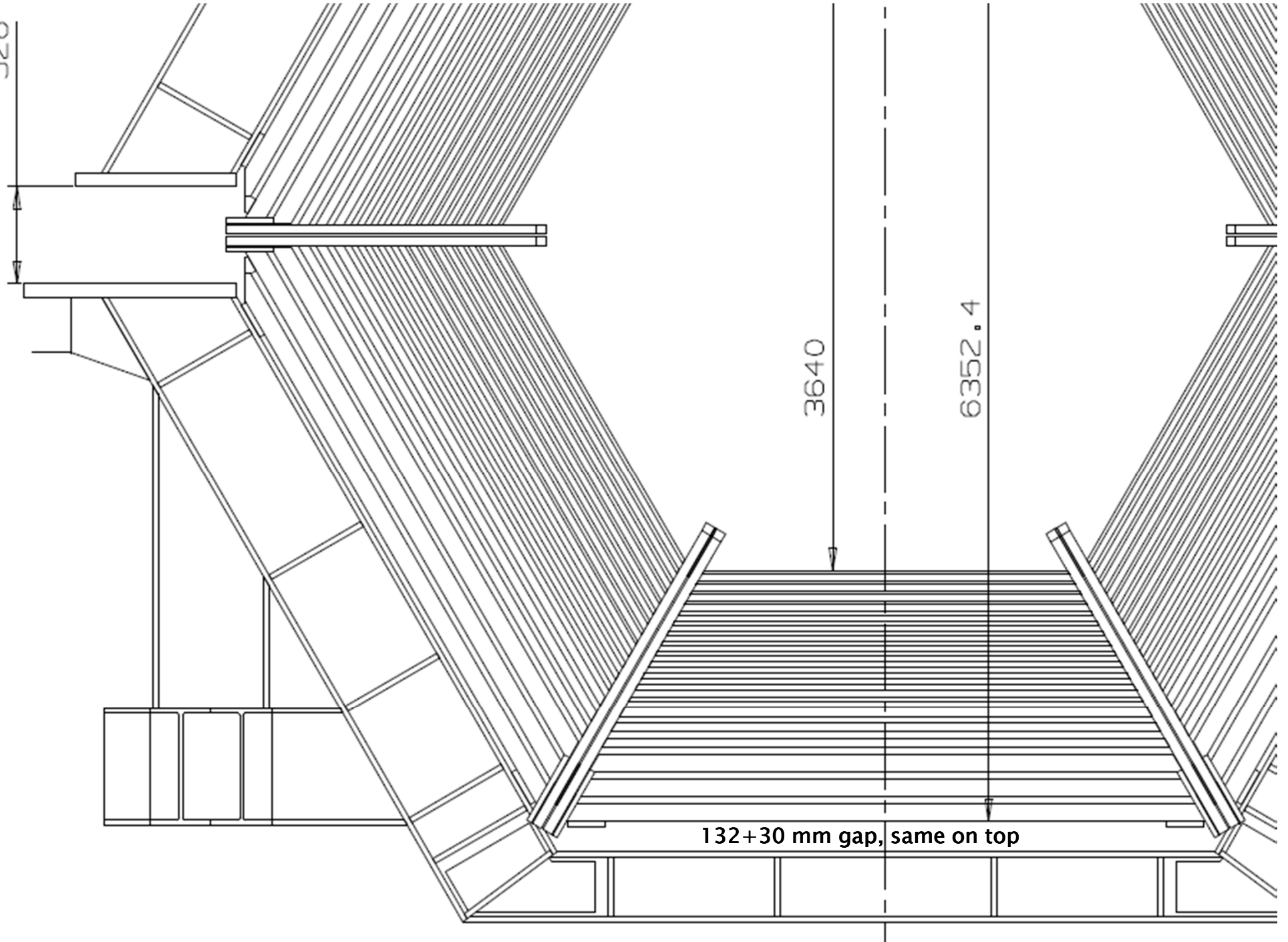


526

3640

6352.4

132+30 mm gap, same on top





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BABAR

Barrel wedges:

Front plates and bars:

Inner loads acting on barrel (magnet, calorimeter, horsecollar?, DIRC-SST-CST):

design weight: 360 t

design weight = 65 t

design weight = 90t

Thus BABAR design weight was ..

515 t +missing & ancillaries

Barrel brass (as done in babar): 70t (+14%)

SuperB hypothesis «+100mm»

Additional iron: 60t

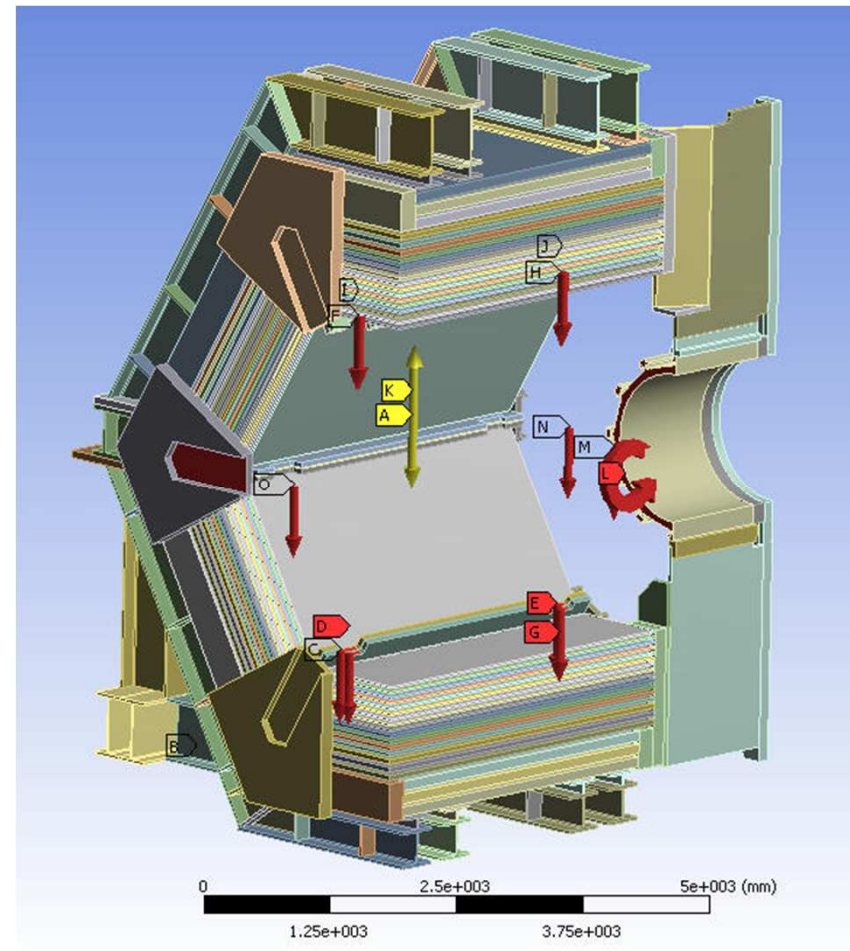
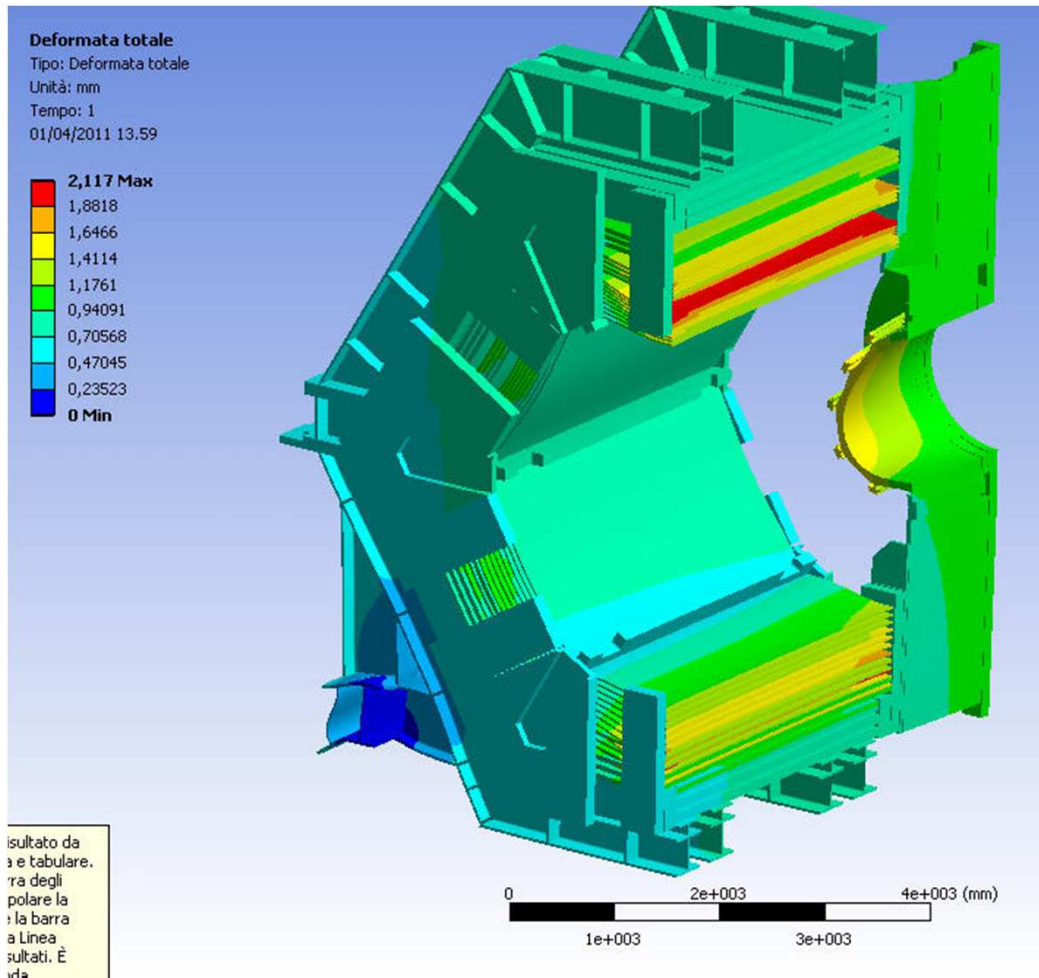
Additional brass/steel (1.5 layers 25 mm thick): 15t

Grandtotal to add: 75t (+15%)

Additional weight for SuperB calculations: about +30% wrt Babar design calculation,
Additional weight uniformly distributed on wedges (mostly @outer radius)

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Hypothesis	thickness [mm]	new iron to buy	new Ssteel to insert [mm of thickness]	Jobs required (apart design)	Costs [k€]					Cost/Dmm (thick-785) [k€/mm]	
					Transport	Ssteel (brass) procurement	Ssteel (Brass) insertion	New iron procurement	Carpentries modifications		Overall
1) Babar with modified cradle/arcs 2 wedges connection, brass filled	896	0	110 mm (5 layers, 53t)	Transport Slac to ... Italy Brass procurement Brass insertion Cradle/arcs modifications OUT Wedges modifications	230	160	50	0	80	520	4.7
2) Add 100 mm outward	915 (-30 / + 90)	100 mm, 60t	32 mm (1.5 layers, 16t)	Transport Slac to ... Italy Brass procurement Brass insertion Cradle/arcs modifications New iron procurement ALL Wedges modifications	230	48	40	180	150	648	5
3) Replace inner wedges	920 up to 1025	720 mm up to 825 mm (from 316t up)	0	Transport Slac to ... Italy Cradle/arcs modifications New iron procurement OUT Wedges modifications	80	0	0	950	80	1110	8.2
4) Replace all	920 up	920mm up (400t up)	0	New iron procurement (cradle and arcs may be recycled)	20	0	0	1200	30	1250	9.3

Baseline: transport cost 25k€/WedgIN+brass, 10k€/WedgOUT, 10k€/cradle, 10k€/2arcs. Material costs (old): Ssteel 3k€/t, brass 7k€/t. New carpentry cost: 3k€/t. Modifications: 10k€/piece. 100mm slabs assumed at 2k€/t. Front plates neglected. Brass insertion at approx. 4.5 k€/ring. To be considered value of selling Brass or recycling for Doors

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Some provisional conclusions:

- Recycling of major parts seems possible without big disadvantages
- Costs of different solutions are proportional to quantity of new parts / parts (tons) to be replaced and to «degree of confidence» of each solution
- Costs of «brass» filling can vary widely depending on material used (magnetic steel, low permeability S-steel, brass)
- To reach the 920 mm thickness choice should be between «+100» and new inner wedges.
- Between those two option the esteem is about 500k€ of cost difference
- Simple filling to 895 mm seems not appealing unless this thickness is fully satisfactory.