



## IFR Visit to SLAC July 2011



1<sup>st</sup> of all

Thanks to SLAC people: Bill W. , Jim K., Osier Shawn, Tom Pulliam  
for help, assistance, explanations, huge quantity of documents :  
CAD models, procedures, calculations, pictures etc

M.B. visit took place from 5 to 12 July:  
IFR barrel was at the beginning of dismounting,  
Corner pieces and some flux return bar removed  
crew was removing bolts between arches and outer wedges.

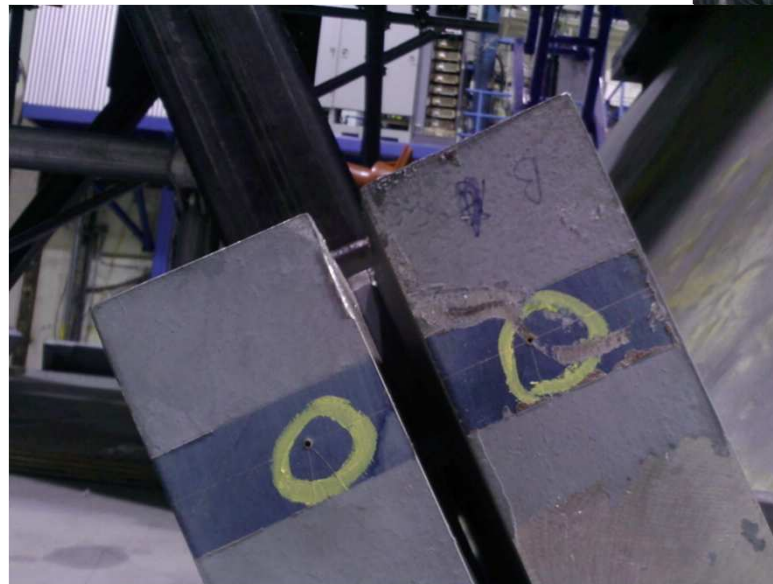
Visit of Federico Evangelisti 10 days later



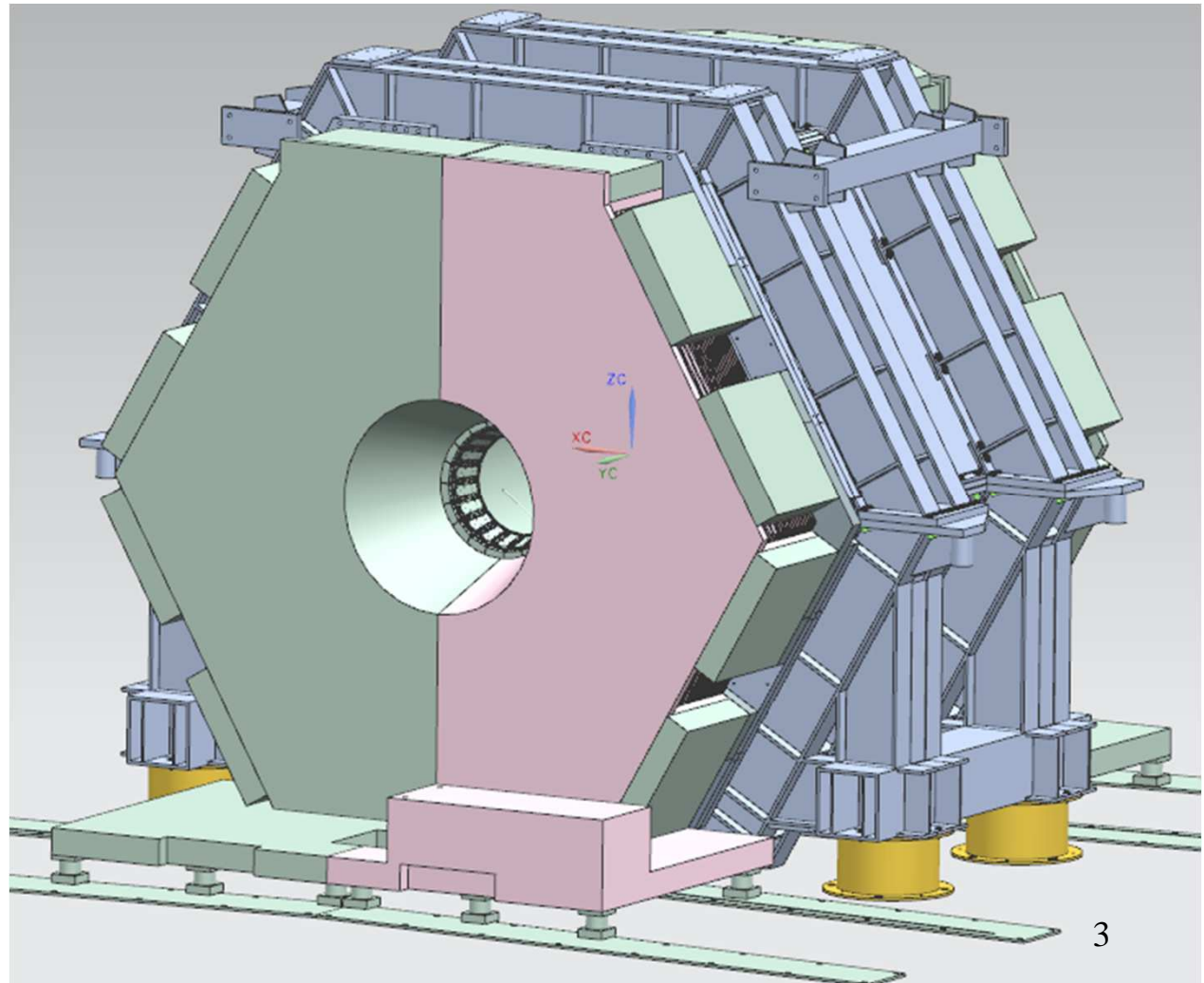
## SuperB IFR Babar IFR 3D measurements



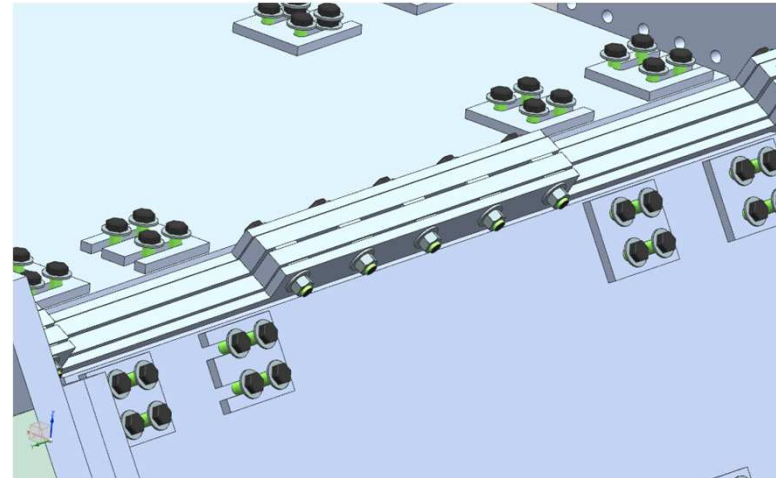
- Babar Barrel have been measured by SLAC survey crew with laser tracker
- No other measure data available apart Z position of corner pieces (done during trial assembly at Kawasaki)
- Measure done shall be useful to crosscheck the geometry during reassembly w.r.t. to the Babar setup.
- Measures may be affected by partial dismounting already done (many bolt removed)
- Measure done wrt dot marks on the front face of side plates of inner wedges
- Measures shall be collected and stored, ensured to be comparable with future measurements



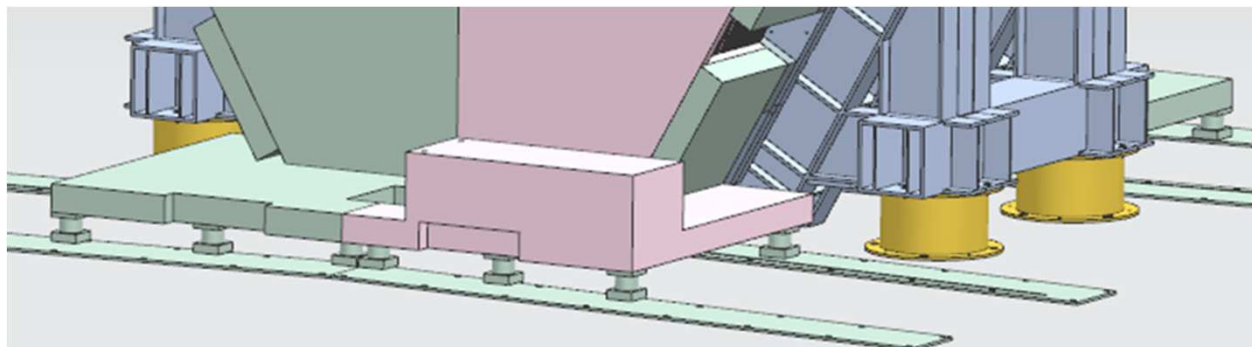
- Got CAD models of full IFR (and cryostat, calorimeter, CST)
- Very likely the most complete and reliable model (when not the only ones existing).
- Models reliability: taken from workshop drawings (reliable?) and/or by handmade measures on actual pieces (precision...)
- Eg top restrain beams on arches



- Shimming between wedges composed by packs of thin plates
- Shimming between outer wedges and cradle/arches composed by pack of (thicker) plate
- It means reassembly will require adjustment and online measuring
- really a lot of shims (36 per each hexagon vertex)
- Very difficult removal of some bolts due to almost non-accessible position (35x60 cm triang. passage)



- Doors are fixed top and bottom to flux return bars, through corner pieces
- Doors can be supported by barrel, lowering doors skid platform (hydraulic jacks)
- Doors shall be assumed supported by barrel
- Supporting doors through barrel imply loading the barrel with unknown load distribution between upper and lower corner pieces.
- To be evaluated most conservative distribution and more realistic one.
- Doors opening (rails + bearings + worm screw mechanism) shall be re-designed to get:
  - More comfortable / easy operations
  - larger/complete opening to allow full access to the barrel detectors





## SuperB IFR About IFR reuse



Parts selection is needed to collect useful parts, devices, tools (and related docs)  
Selected parts storing at SLAC: where, how long ...  
(Tools and frames still laying in open air? risk of damages, corrosion, losing)  
Damaged or cut screws/holes: repair hole and thread (helicoil insert), new screws  
Storing once in Italy: when, where (main hall or logistic hall ...)

Anti-seismic devices:

Elastic absorbers/pads ok,

X, Z restrain structures existing, no docs, Y bars cut, top arches restrain bars

Missing

measures made during and after Babar assembly, if any

X, Y and Z restrain structures drawings and models (Y bars were cut...)

seismic calculation of IFR, IFR supports

Cryostat supports / adjustable feet



## SuperB IFR MOU and or Database



### **Need of MOU?**

- Identify a list of the useful parts, tools, frames
- Items shall be identified, coded, restored, stored, maintained
- Interventions: cleaning, painting, lubrication, repair tapped holes ...(cooling & gas feeding)
- Storing at SLAC: how long, where ...
- Access/transfer of barcode database, any other docs
- Access/transfer of photographs, pictures / sequences from webcams etc ...

### **Need of DATABASE !**

- Official, accessible, reliable
- Per each "item": name, code/barcode, working drawings, CAD models, related assembly, pictures, procedures and tools for lifting, handling, assembly, calculations, non conformities, storing location, maintenance status/requirements
- Non conformities: defects, damages, large deviation from nominal dimensions/shape ...
- IFR measurement done by SLAC survey ...



## SuperB IFR Check of the barrel gaps width



Barrel gaps width checked by Federico Evangelisti, mid July, using as gauges 1”1/4, 1”, 23.5 mm (15/16”?) cylindrical bars (pipes) inserted along Z, sweeping side to side.

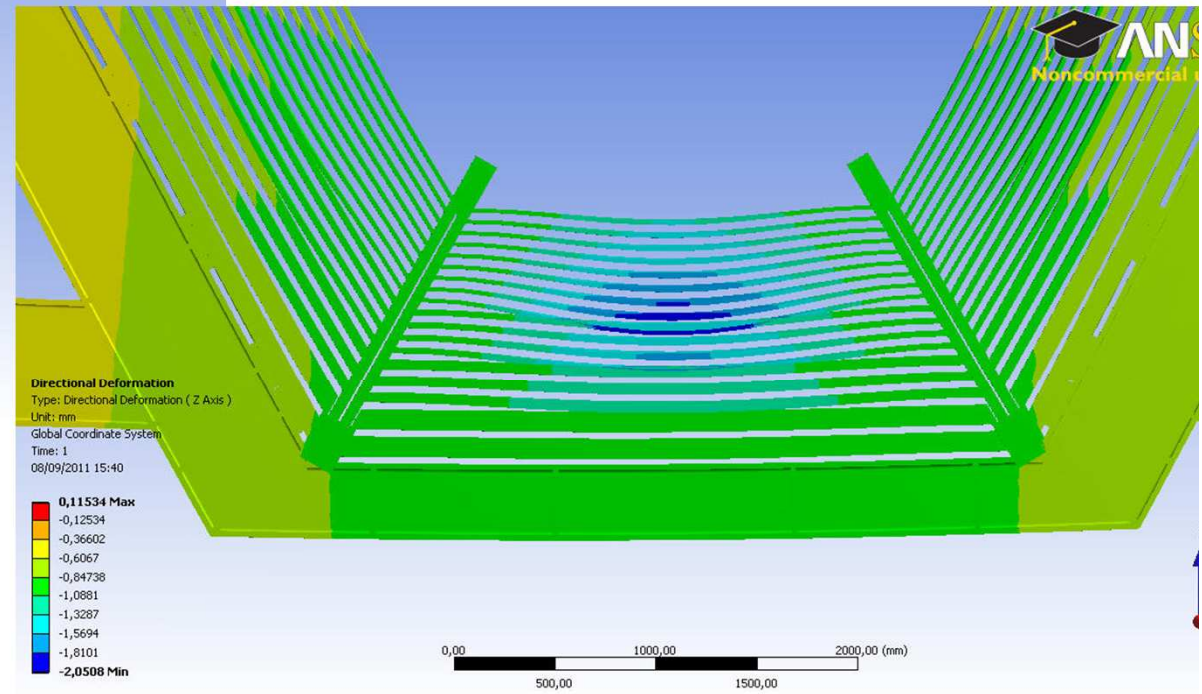
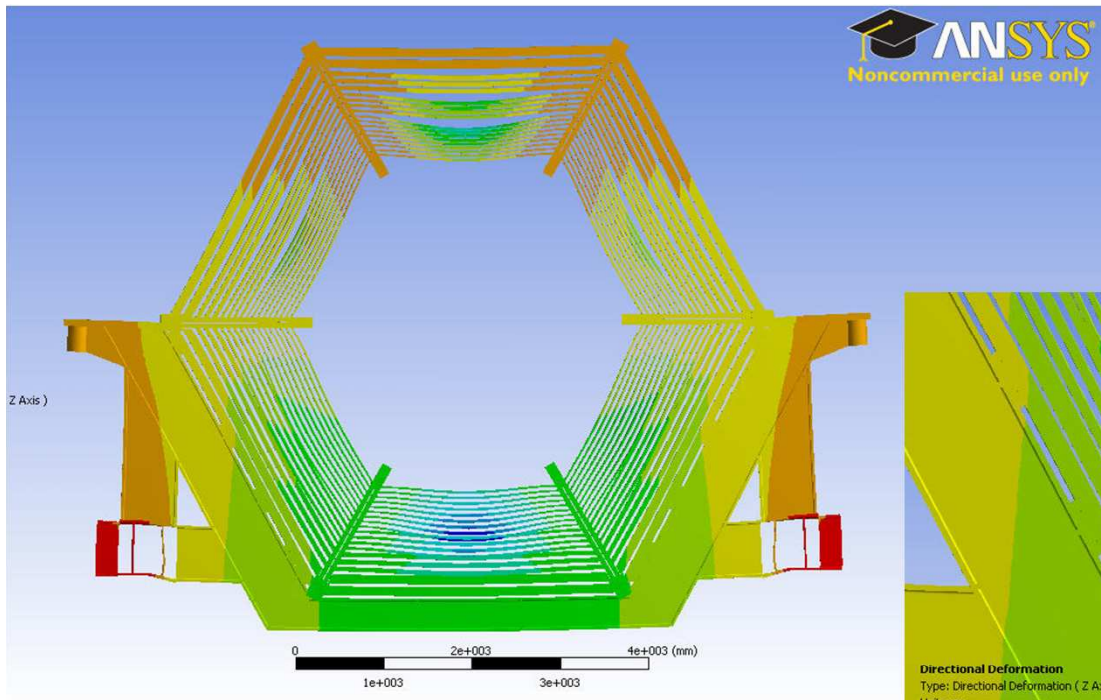
- Gap nominal dimensions is 35mm (btw. 20mm “thin” plates) and 32mm (btw. 30 and 50 mm plates).
- The 1”1/4 pipe (31.75 mm) does not fit in most of the gaps (fit only in the first 5 – 10 cm).
- The 1” pipe move freely in all the gaps, except gaps # 2, 3, 13 of the bottom sextant (sextant #3).
- In the mentioned gaps of bottom sextant even the 23.5 mm tube does not enter
- In the gap 14 the 1” pipe enter but does not run freely
- Deformation due to brass? Gaps filled with brass: # 4,6,8,10,12,14, (right?) may affect only gap #13.
- Gap spacing in the lower wedge may be affected by deformed Barrel, being the arches and corner blocks already removed. See preliminary FEA analysis. Should affect gaps #9,13,16
- Preliminary conclusion: useful available space for pizza-boxes can be assumed to be 26 – 27 mm except for the mentioned 4 gaps of the lower wedge.
- Many gaps still have inside 1 or 2 G10 plane(s) about 0.8 mm each (but not in the critical gaps).
- Could be useful redoing measurements with 20 - 22 – 25 – 27mm panels (e.g. honeycomb)
- Doors not yet checked.





# SuperB IFR

## Check of barrel gaps width





## IFR Conclusions



- Got a lot of documentation, need to be ordered, selected, stored and digested
- Still some items missing in terms of documentation and 3D models
- Official database absolutely needed
- Gaps check to be completed with transversal panels to confirm what found
- Doors movements to be redesigned

Thus concerning dilemma of IFR increasing :

- Technical solutions envisaged for SuperB IFR seem still valid:  
1) filling with plates, 2) increase of diameter, 3) wedges replacing.
- Bottom wedge could invalidate (locally) 1) and 2)

Next steps should be:

- Build and fill database
- Produce panels and check barrel and doors gaps:  
useful in case 1) and 2), for pizza box and gap filling with 25mm thick plates