



## INTRODUCTION TO THE 6<sup>th</sup> GSI-INFN MEETING FOR SIS300 DIPOLE DEVELOPMENT

This meeting is aimed to discuss the status of the R&D activities in view of the objectives of 2007

- a) Conceptual Design
- b) Engineering Design (up to collared coil)
- c) Construction of the winding models

With the just awarded contract to ASG, all these activities are now started!

The agenda has been arranged accordingly





#### **AGENDA**

1) Status of the R&D program	P.Fabbricatore	20'							
General Program updates (in view of the presentation at minitac)									
Specific Program for 2007 updates (in view of the presentation at minitac)									
Introduction to the technical points to be discussed.									
2) Status of the conductor R&D program	G.Volpini	20'							
3) Paramagnetic effects in NbTi/ CuMn wires	U.Gambardella	10'							
4) Magnetic lay-out	M.Sorbi	20'							
5) Thermal steady state and transient analyses	M.Sorbi	20'							
6) Materials and lay-out for collars and steel lamination	P.Fabbricatore	20'							
7) Mechanical 2D analyses	S.Farinon	30'							
8) Dimensions of insulation and mechanical properties.	S.Farinon	15'.							
9) Design integral harmonics. Harmonics measurements									
Investigate the possibility to measure the harmonics on collared coils with a GSI tool									
10) Cryostat issues.		GSI							
Though the horizontal cryostat will came later we should like to start a discussion about the GSI									
ideas about the cryostat lay-out and constraints									
11) Activities at GSI (Ra measurement at BNL, 6T dipole model at IHEP, wire/cable									

12) Material data base- status,....

measurements at UT, GSI001)

13) Contribution INFN to the PAC invited talk: FAIR rapidly cycling magnets all

J. Kaugerts

11) Next meetings. Videoconferences



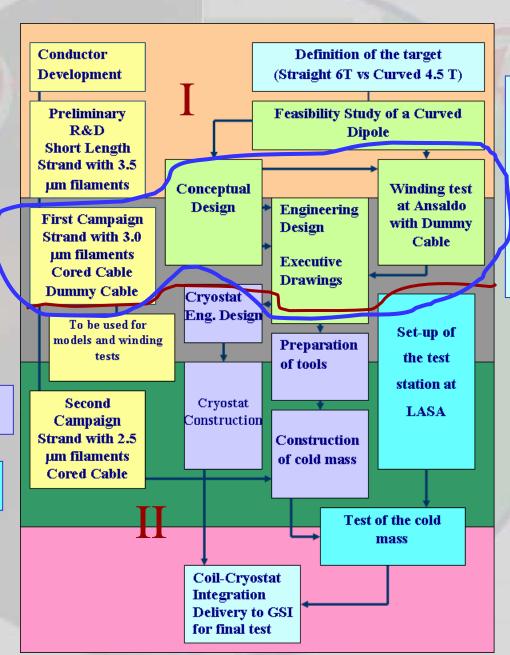


#### Conductor

Studies, Design and Models

Construction

**Tests** 



The INFN R&D program for curved SIS300 dipole.

#### Two steps

Final goal:

3.5 m long

4.5 T

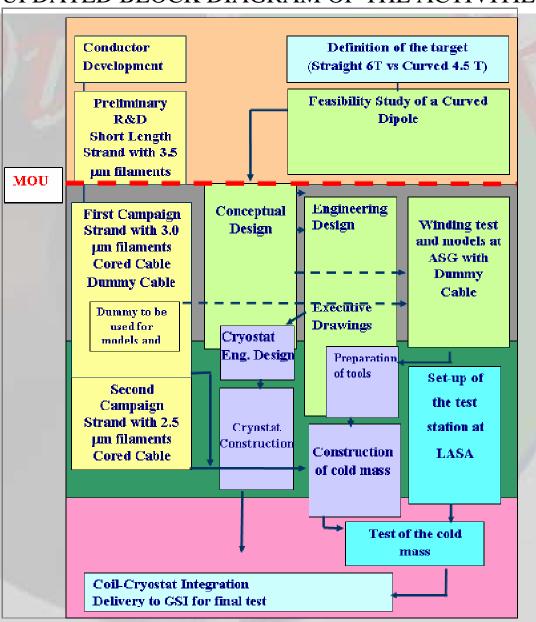
curved dipole in its horizontal cryostat





7 C-Clamp







Explanation Activity

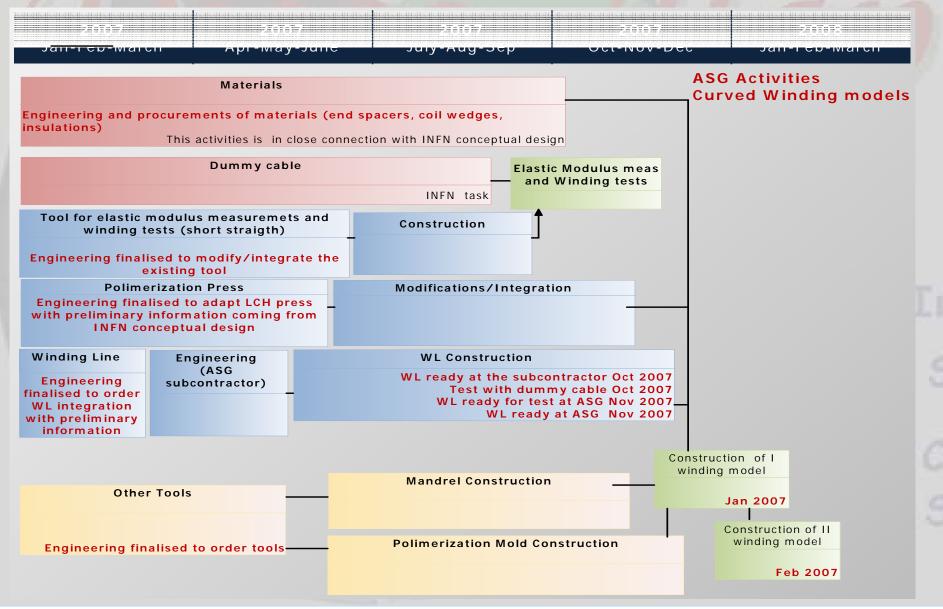


DISCO_RAP schedule		20	06			200	07			20	800			200	09		18/11
Conductor Development  1 Preliminary development Wire assessment and specifications drafting  2 Minimal GSI Rutherford cable Dummy cable manufacture 3 Optimal Requirement Conductor ready for the winding	i	ii	iii	iv	i	Ñ	iii	iv	-	ii	iii	iv	i	ii	iii	iv	19
Upgrade of INFN experimental facilities     Electrical characterization of the conductors													<del>\</del>				
Cold Mass Construction 6 Feasibility study of curved dipole 7 Conceptual Design Tool Procurement Construction of winding model													\				
9 Engeneering Design 10 Engineering for modifying/integrating LHC tool 11 Study of mechanical properties of materials Engineering Design Completed														/			
<ul> <li>12 Tool Modification and Integration</li> <li>13 Materials Procurement</li> <li>14 Components Construction (Collars, Steel Laminaton, Fillers,)</li> <li>15 Coil winding</li> </ul>																	4 :
16 Collaring, yoke and containment cylinder integration Cold Mass Completed  Magnet Test																	5
<ul> <li>17 Design of Cryostat and Power Supply</li> <li>18 Manufacture of Cryostat and Power Supply</li> <li>19 Commissioning of Test Station @ LASA</li> <li>Test Station ready for the cold mass test</li> </ul>														,			
<ul> <li>20 Integration of cryostated magnet into the test station</li> <li>21 Test of the Cold Mass         Cold Mass Tests Completed     </li> <li>22 Design of Horizontal Cryostat</li> </ul>																	7
23 Manufacture of Horizontal Cryostat 24 Acceptance Tests Horizontal cryostat ready													ı				10





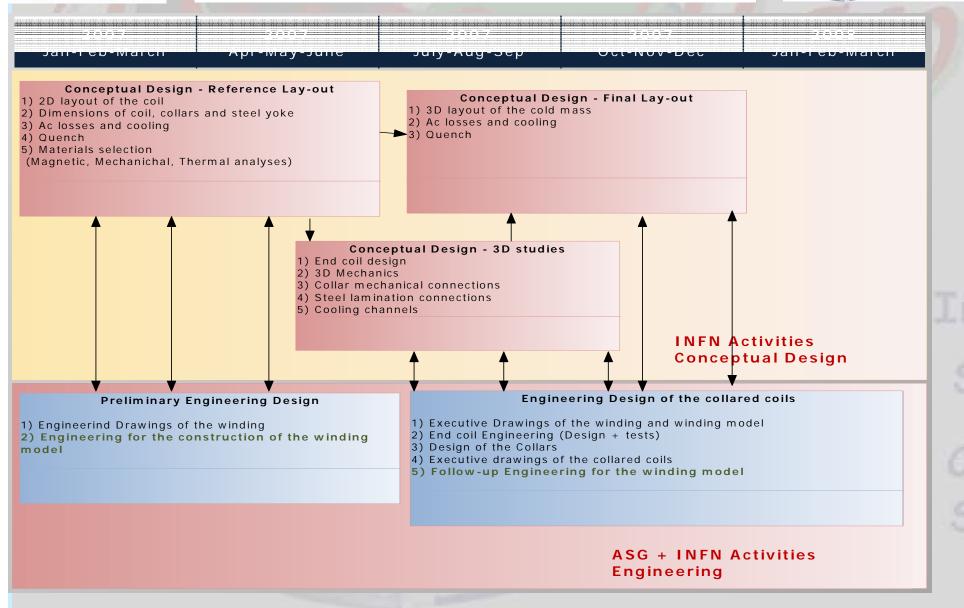
#### Construction of the winding models





# Disco Rap Key 4 Iron yoke 5 Shell 7 C-Clamp 6 Staples

### Conceptual Design and Engineering







The reference lay-out can be finalised within June. The actual pending issues are:

- 1) Collar thickness: the ongoing studies shows that a thickness between 22 and 27 mm could be more suitable (P.F and S.F presentations)
- 2) Coil mechanical properties Thickness and details of the insulation (S.F presentation)
- 3) Effect of the wire paramagnetism (U.G. presentation)
- 4) Optimization of the iron yoke Trial computations done. To be finalised after the winding and collars lay-out is completely frozen (M.S. presentation)
- 5) Wire cross section lay-out). (G.V presentation)