

Detector Magnet CDR Related Topics

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On behalf of magnet team

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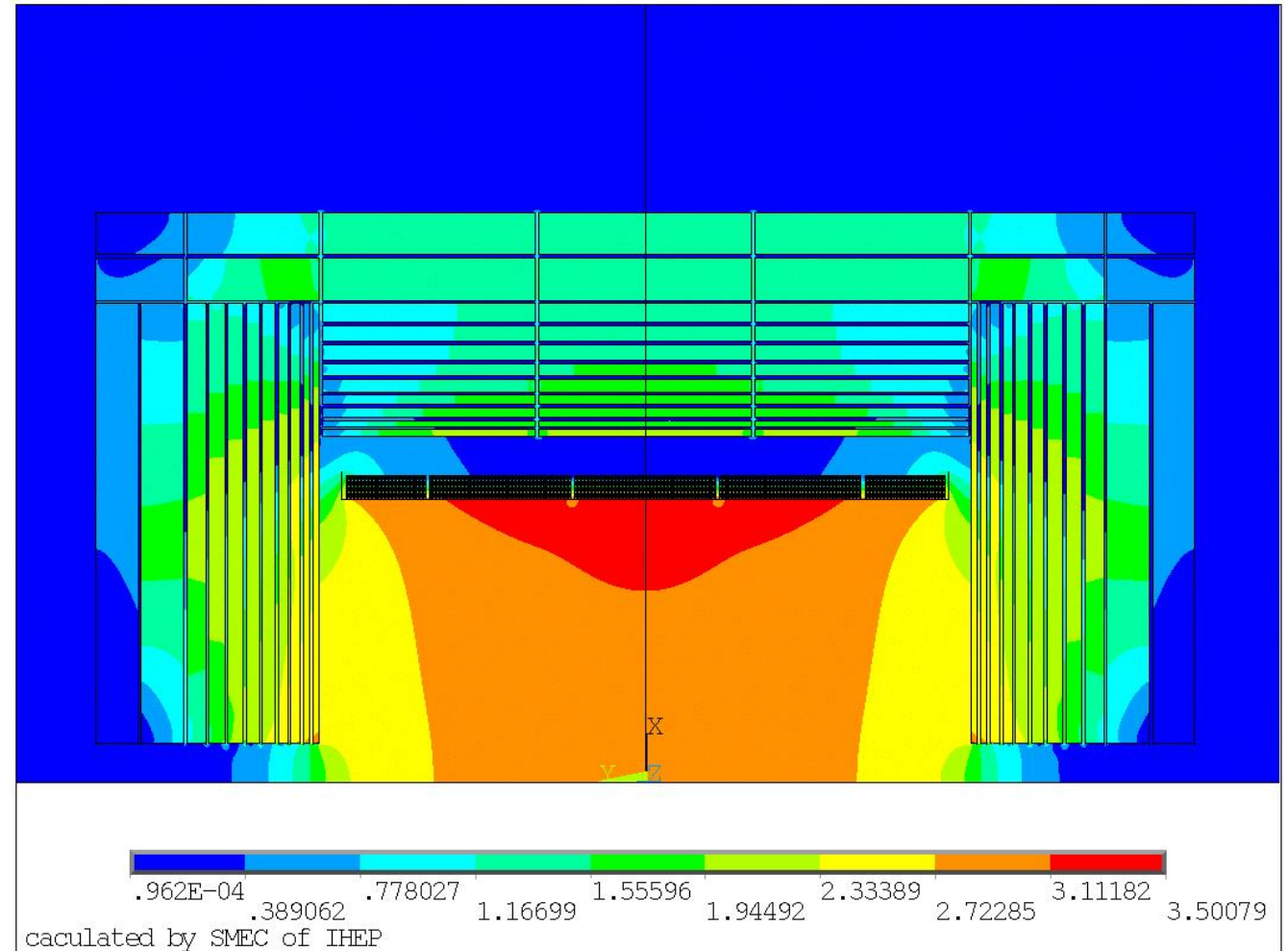
Outline

- Magnetic field design of 3T
- Progress of the Superconductor R&D
- CDR: Chapter 6 Detector Magnet system
- Questions for MDI
- Next

1. Magnetic field design of 3T

Main Parameters

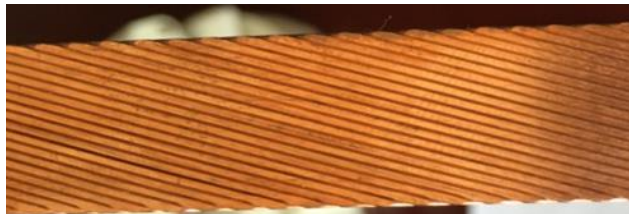
Central magnetic field (T)	3.0
Operating current (A)	15779
Stored energy (GJ)	1.3
Inductance (H)	10.46
Coil length (km)	30.35



2D Magnetic field distribution(unit: T)

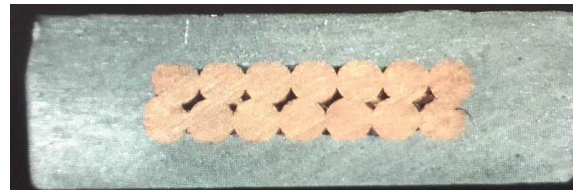
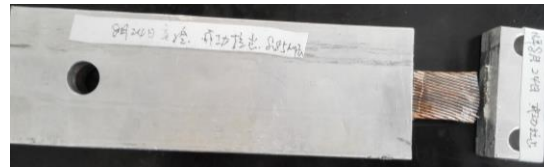
2. Progress of the Superconductor R&D

Rutherford cable fabricated by Toly Electric



NbTi Rutherford cable

Shear strength between aluminum alloy and rutherford cable



Number of strands : 32
Strand diameter :
1.2mm
Materiel : **COPPER+Al**
Length: 1m
Complete time: 2016.8
Shear strength (copper
&Al) : **8.85 MPa**



Dimensions: 15*4.7mm²
Number of strands : 14
Materiel: **NbTi+Al(99% purity)**
Complete time: 2017.4
Shear strength: **10 MPa**



Dimensions: 15*4.7mm²
Number of strands : 14
Materie: **NbTi+Al(99.99%
purity)**
Complete time: 2017.8
Shear strength: **>35MPa**

Short sample < 5m

3. CDR: Section 6 Detector Magnet system

- 6.1 General Design Considerations
- 6.2 The Magnetic Field Requirements and Design
- 6.3 HTS/LTS Superconductor Options
- 6.4 Solenoid Coil Design
- 6.5 Magnet Cryogenics Design
- 6.6 Quench Protection and Power supply
- 6.7 Iron Yoke Design
- 6.8 Dual Solenoid Scenario

3. CDR: Chapter 6 Detector Magnet system

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Questions for MDI

1. Need detail design of machine magnets to study the field homogeneity
2. Need requirement of stray field both from machine and detector

Next

- Detail analysis of 3T
- Development 100m length 10kA NbTi/Aluminum superconductor cable
- CDR writing