

Interface of the 2x5.5 m 11 T Cold Masses

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On behalf of CERN-FNAL collaboration

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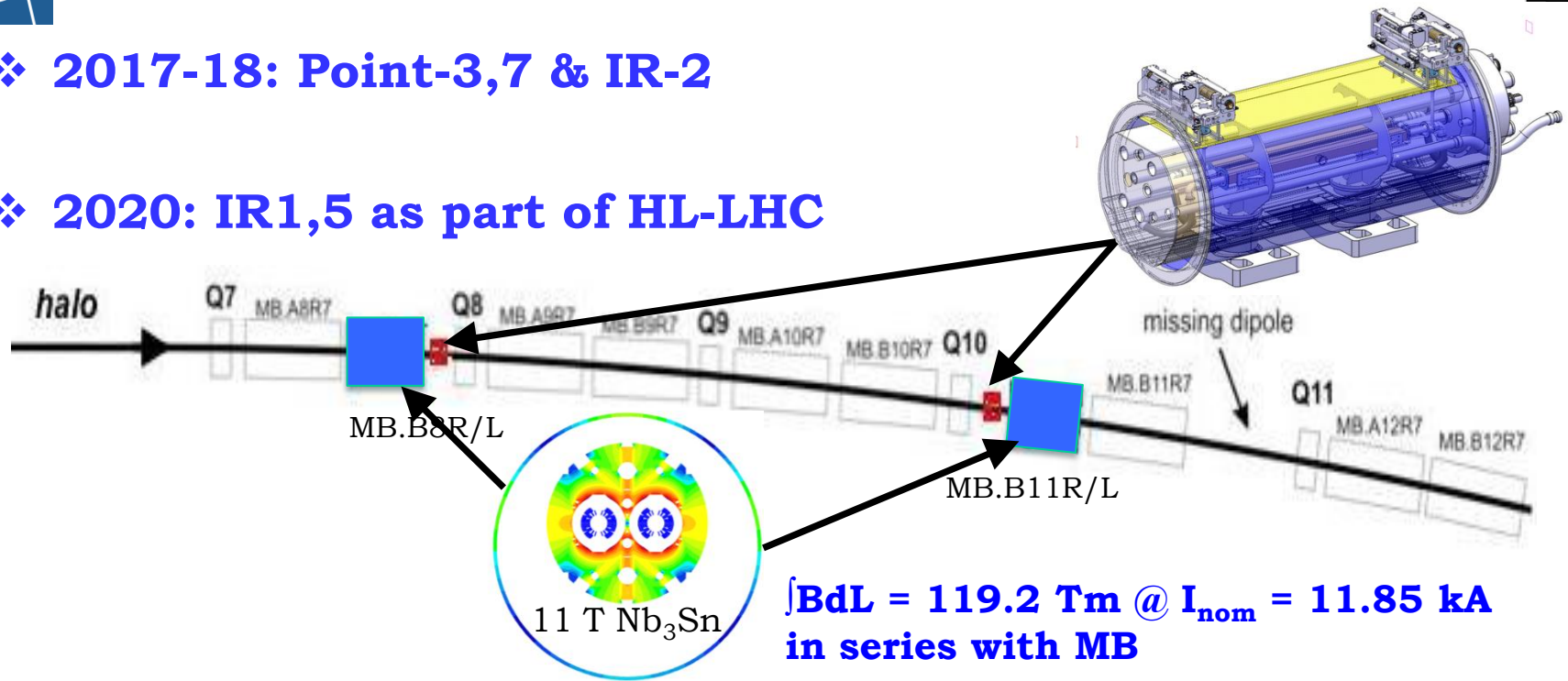
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DS Upgrade



- ❖ 2017-18: Point-3,7 & IR-2
- ❖ 2020: IR1,5 as part of HL-LHC



11 m Nb ₃ Sn	3 m Collim
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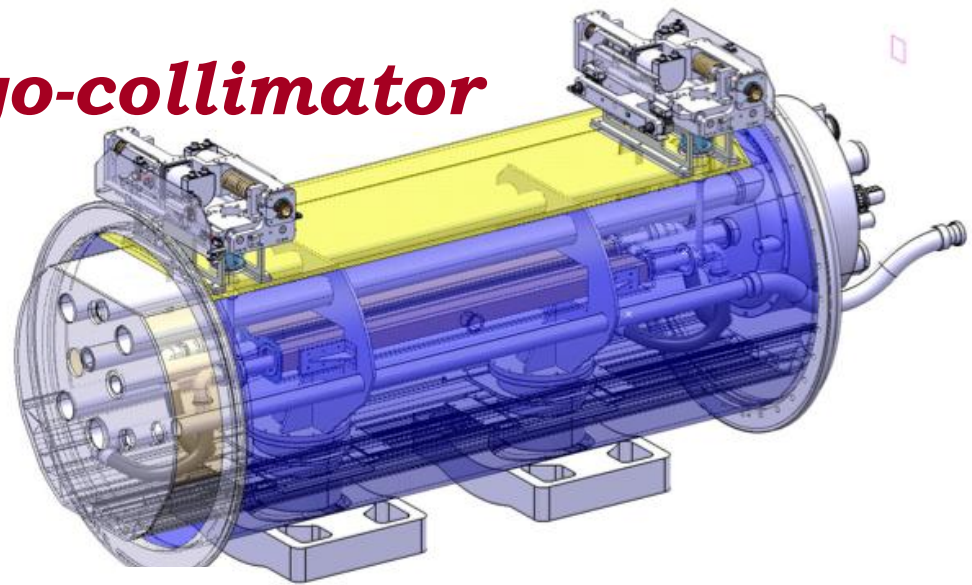
5.5 m Nb ₃ Sn	5.5 m Nb ₃ Sn	3 m Collim
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5.5 m Nb ₃ Sn	3 m Collim.	5.5 m Nb ₃ Sn
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(11.2 T x 10.6 m), L_{CM} ≈ 11 m, (MB -4.2 m)
=> 12 coldmass + 2 spares = 14 CM

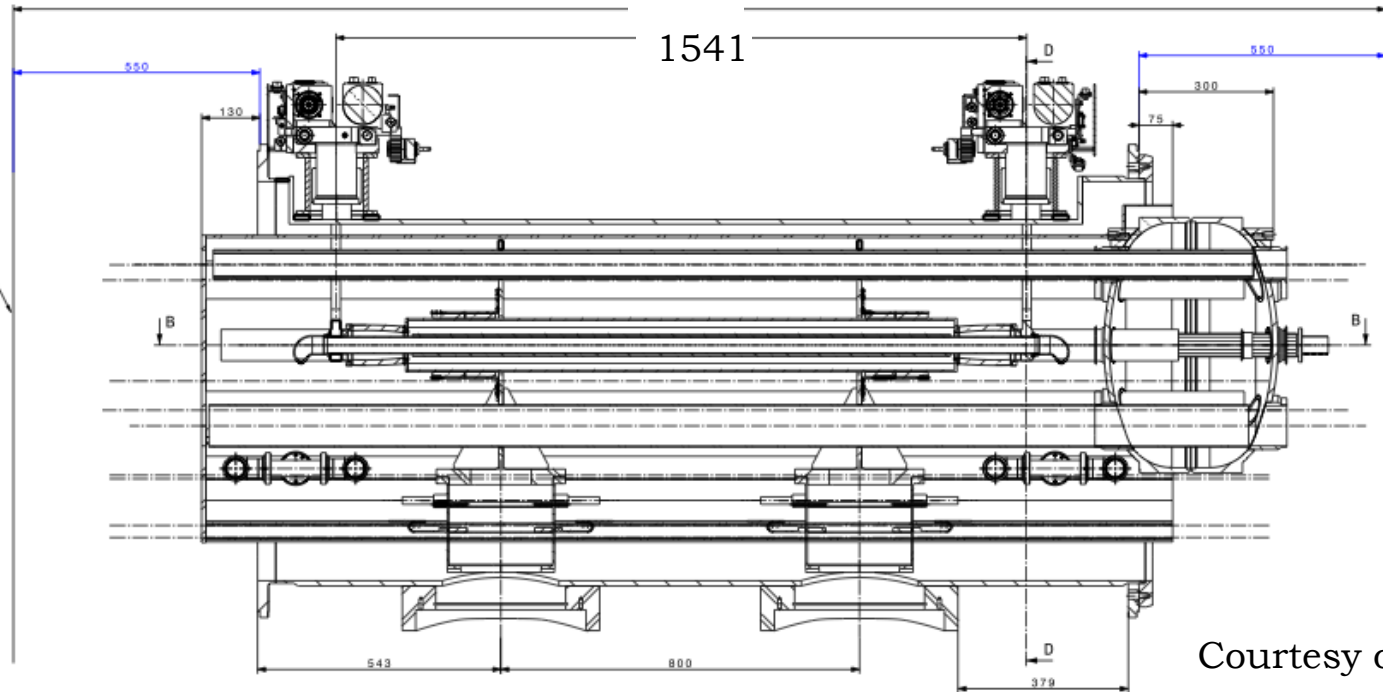
2 x (11.2 T x 5.3 m), L_{CM} ≈ 11.5 m, (MB -3.7 m)
=> 24 coldmass + 4 spares = 28 CM

Cryo-collimator



3061

1541



Courtesy of D. Ramos

600 A correctors powering
300 A trim powering
Dedicated QPS system

Beam Pipe

CM integration:

- Alignment
- Bus-bar routing
- Expansion liras

Cryo integration:

- Collimator location
- Collimator tuning
- Collimator maintenance
- Cryogenic separation

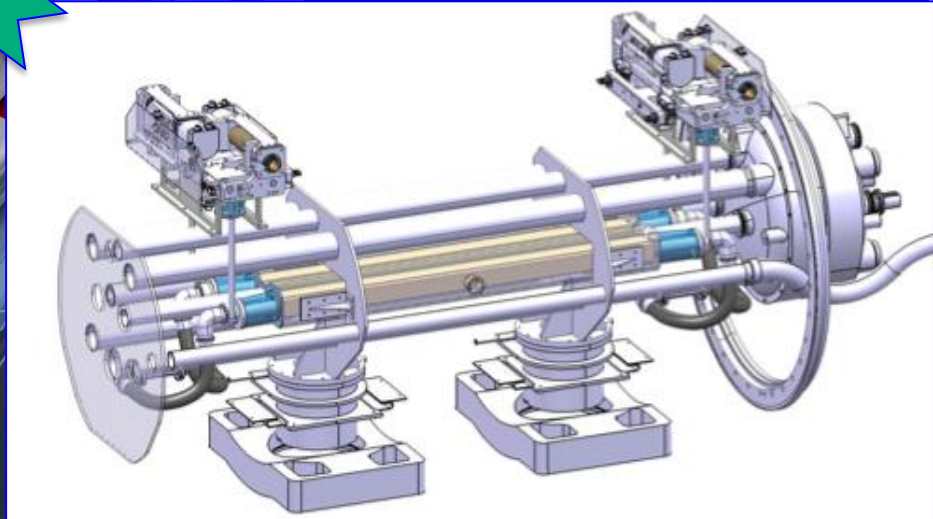
Spool Piece
Bus Bars

Quadrupole
Bus Bars

Auxiliary
Bus Bar Tube

Protection
Diode

Instrumentation
Feed Throughs



15-m long LHC cryodipole



❖ Cold mass integration

- **Alignment of the 5.5 m CM (straight – with an angle)**
- **Bus-bar lay-out and integration**
 - Dedicated to each 5.5 m CM
 - Splices
 - Expansion loops
- **Heat exchanger integration**

❖ Collimator

- **Minimum dimensions**
- **Operation requirements**
- **Access and maintenance requirements**

❖ Cryo-assembly

- **Magnet services: trim powering, correctors, QPS, instrumentation**
- **Collimator location and screening from magnets**
- **Space requirements**
- **Interconnects**