

I.FAST WP8

Eu program for SC Magnets for ion therapy machine



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IFAST-WP8 is linked to HITRI + WP 8
But in IFAST we manufacture
demonstrator sin INDUSTRY

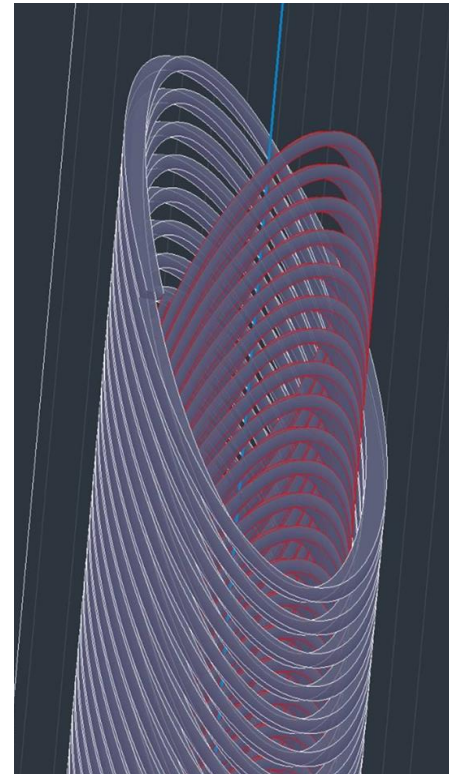


We will develop CCT: starting from p-gantry and HiLumi LHC we make a step: CURVED

LBNL: CCT coil prototype for large acceptance proton gantry $\varnothing = 400$ mm: Successfully tested to 3.5 T; segmented former

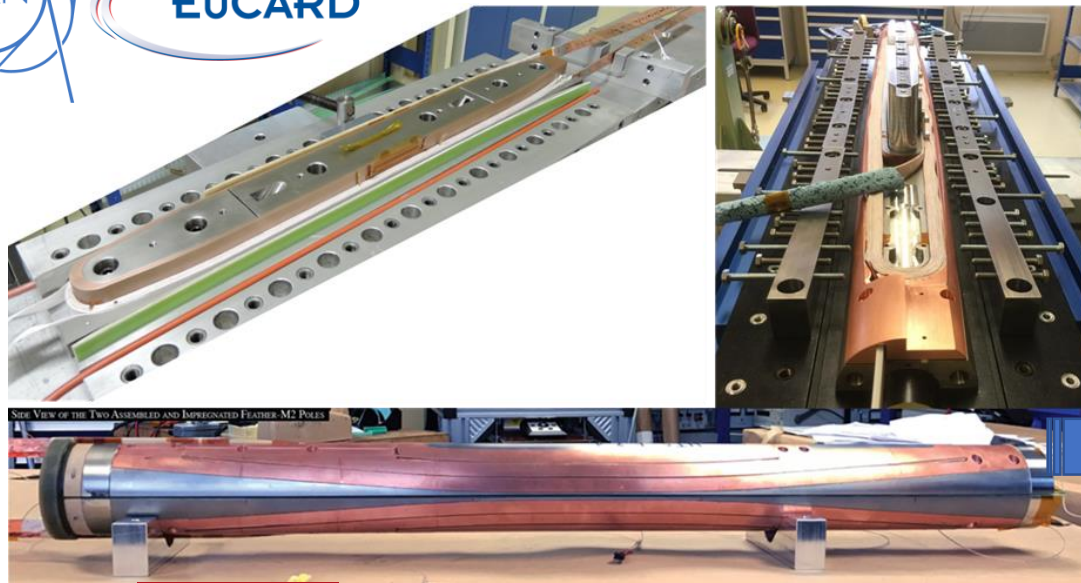


HiLumi LHC: CERN has designed, built and tested a dual 3 T, 2 m long - $\varnothing = 90$ mm, straight CCT. Now IHEP Beijing producing 2x13 units

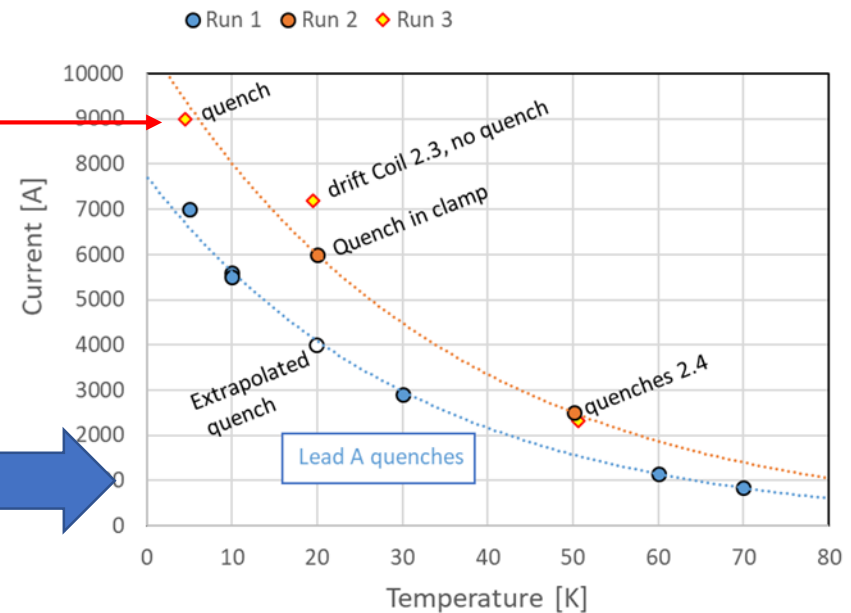


And we will make first CCT straight in HTS starting with the previous EuCARD(2) and Aries

CERN Feather M2: flare end race track, REBCO Roebel cable, **40 mm bore**



> 3 T in 2017; 1st magnet
 > 4.5 T in 2019; 2nd magnet
 ~ 6-7 T in 2021; 3rd magnet, hopefully!



CEA HAS ASSEMBLED a cos θ dipole, 40 mm bore, with REBCO Roebel cable: test in 2021



3 March 2021

Rossi - Quettier - I.FAST WP8 -Magnets - IFAST Open ST COMM

The H2020 – IFAST – WP8 program

- **WP8 on Innovative Superconducting Magnets**

- Conceived as after-HITRI: fostering innovation: → exploring HTS cable and new magnet layout
- **Involve Industry in the know how build up is a key goal for the WP.**
- CCT made of: CORC[®] ?, stacked tapes? Roebel? Or Bi-2212 Rutherford cable? Other magnet layout?
- The WP8 fosters also a panel to steer HTS for accelerator magnets in EU

- An independent task is the development of a HTS cable suitable for low losses - large size - fast cycling – synchrotrons
- **Led by GSI. Also here Industry is heavily involved.**

I.FAST WP8 Innovative SC Magnet. Demonstrators in Industry!!!



UPPSALA
UNIVERSITET



Istituto Nazionale di Fisica Nucleare



PAUL SCHERRER INSTITUT



UNIVERSITÉ
DE GENÈVE

Money redistributed
among BNG and Elytt



ELYTT ENERGY



SCANDITRONIX

Members	Person-months	EC funding	Institute matching funds	TOTAL Funds
CEA	10	42,188	76,705	118,892
CERN (UniGe associated)	11	190,153	345,732	535,884
Wigner RCP	24	24,638	44,795	69,433
INFN	14	112,613	204,750	317,363
CIEMAT	12	26,438	48,068	74,506
UU	5	31,500	57,273	88,773
PSI	6	28,688	52,159	80,847
BNG	10	64,313	116,932	181,244
Scanditronix	10	59,938	108,977	168,915
Elytt	15	59,938	108,977	168,915
Sigmaphi	15	59,938	108,977	168,915
Grand Total	132	700,340	1,273,345	1,973,685

INFN is the WP8 – Magnet Coordinator; CEA is the deputy Coord.
The budget shown includes 50 k€ (placed at CERN) of the EuStrategyGroup; it does **not include** the 200 k€ of GSI-UT-IEE-ILK for ramped cable (sorry)

Deliverables related to WP8

<p>D8.1: HTS European Strategy Group. <i>Set up of the ESG and kick off meeting with approval of program, scope, and modus operandi.</i></p>	M6
<p>D8.2: Conceptual Design of curved CCT in LTS (Low-Temperature Superconductor). <i>Report with complete list of parameters motivating the choice for the design.</i></p>	M10
<p>D8.3: First Engineering design of the HTS demonstrator. <i>Report with a set of coherent parameters of the near-to-final design.</i></p>	M18
<p>D8.4: Construction of curved CCT demonstrator. <i>Magnet demonstrator complete with electrical termination and transport constrains.</i></p>	M38
<p>D8.5: Construction of HTS CCT demonstrator. <i>Magnet Demonstrator with electrical terminations and transport constrains.</i></p>	M42
<p>D8.6: Fast-cycling Nuclotron HTS cable design. <i>Design parameters of the HTS Nuclotron cable aiming at 6 T magnetic field cooled by two phase forced flow Helium, AC loss measurements.</i></p>	M32

MS31	Construction readiness of curved CCT demonstrator	8.1	20	Review report
MS32	Characterization of the first length of superconductor for low losses	8.2	6	Measurement reports
MS33	Conceptual design of HTS magnet	8.3	10	Design report
MS34	Construction of the curved formers for CCT winding	8.4	32	Report with conformity certificate
MS35	Test of mock up coils with dummy cable	8.5	38	Report on test and assessment of CI