

SAND – System for on-Axis Neutrino Detection

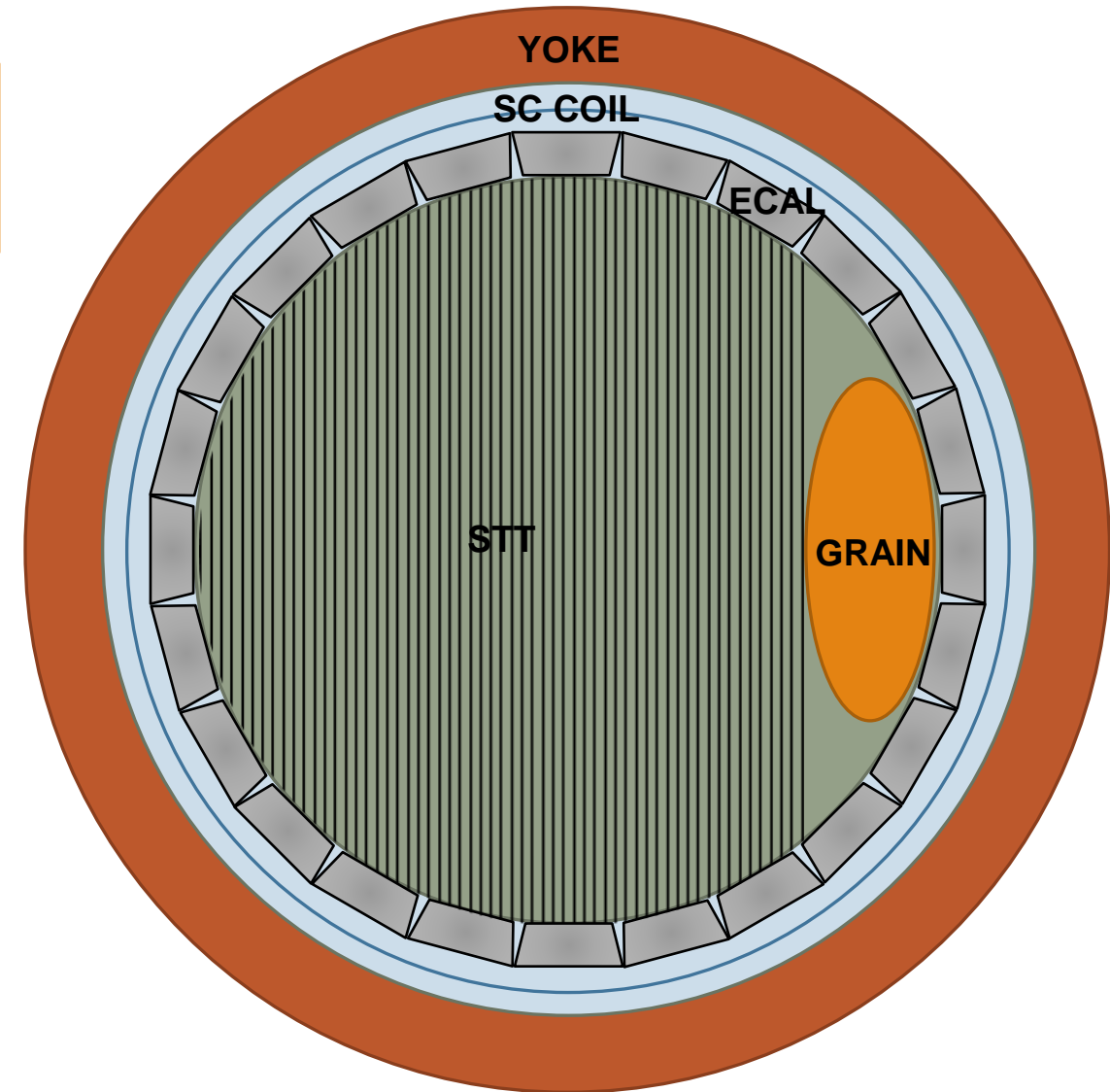
Multipurpose detector
high performance ECAL, light-targeted tracker,
LAr target, all in magnetic field, always on beam axis

GRAIN – 1 ton liquid Argon target with VUV imaging system (fully optical read-out)

STT – 5 ton Straw-Tube tracker with “solid-H” target
CH₂ and C interleaved slabs

ECAL - KLOE Lead Scintillating Fibers calorimeter
(Barrell + EndCaps)

MAGNET – KLOE 0.6T superconductive coil + Fe Yoke



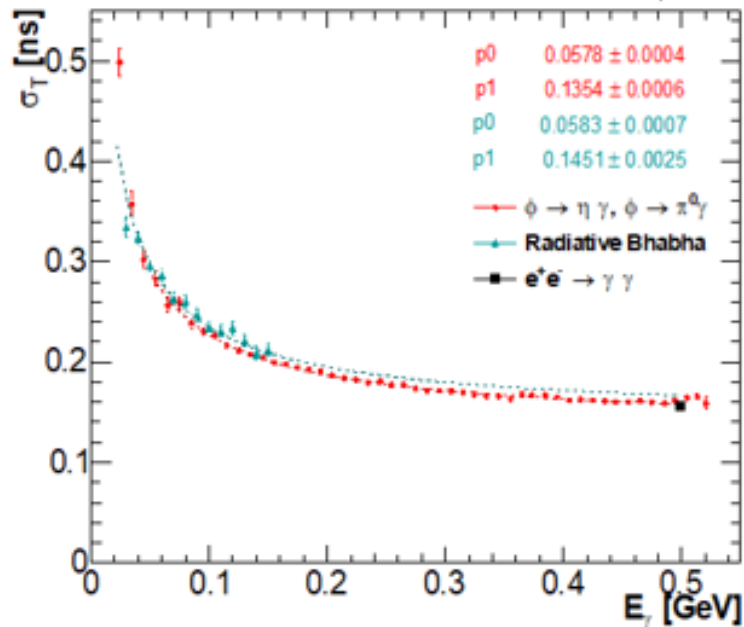
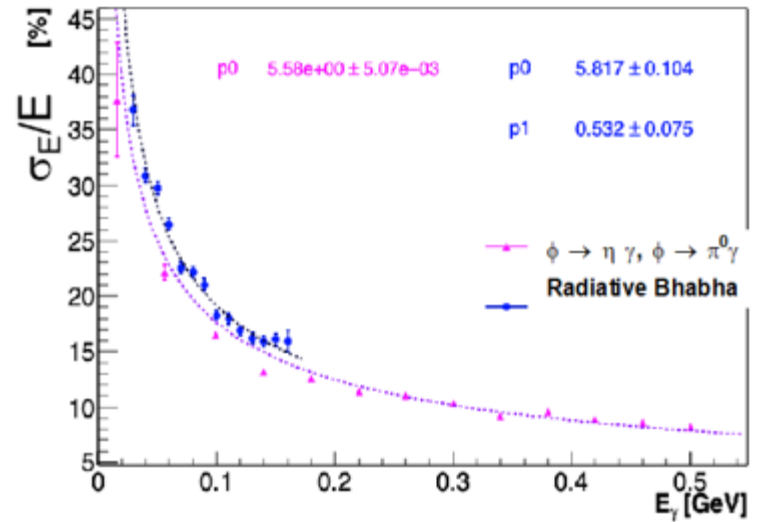
KLOE ECAL Performance

Lead-Scintillating Fibers
4880 PMTs read-out
98% solid angle coverage

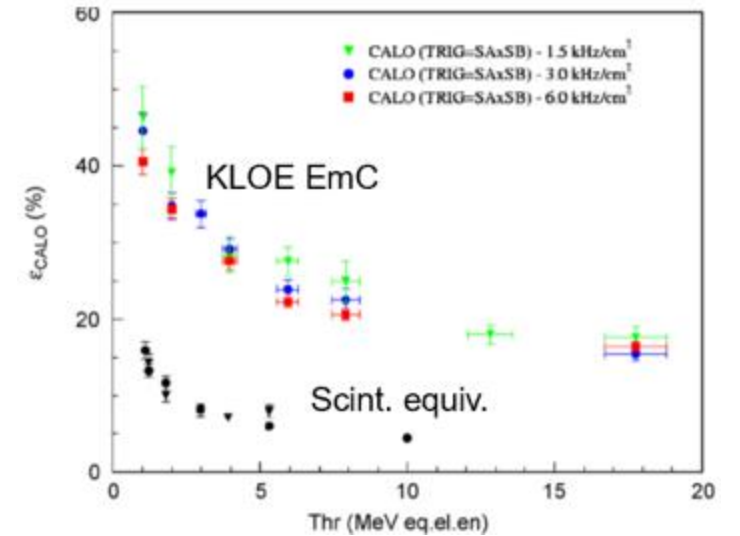
24 Barrell modules
64 C-shaped EndCaps modules

Energy and Time resolution
measured in 2015-2018 run

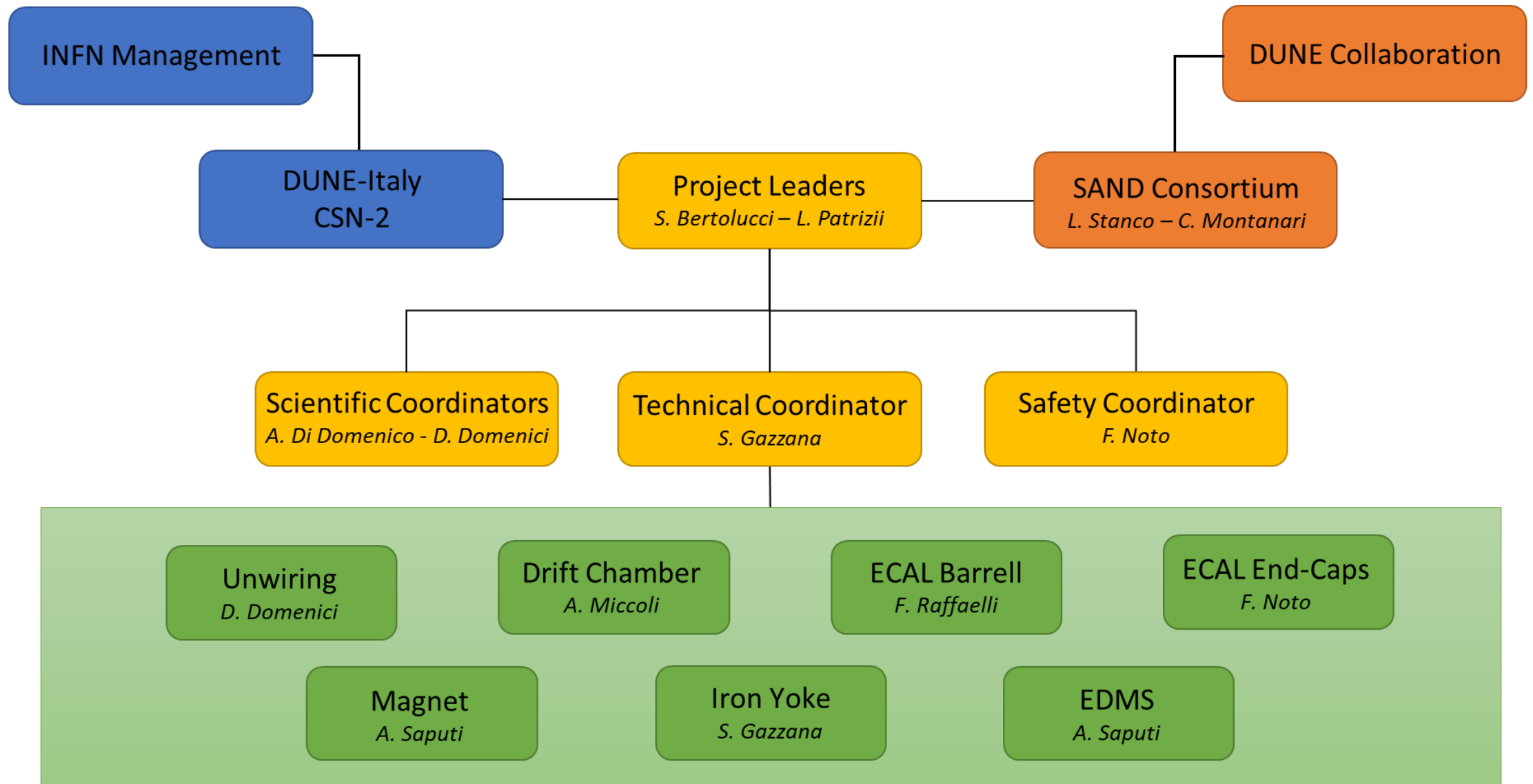
$\sigma_E/E = 5.6\% / \sqrt{E(\text{GeV})}$
 $\sigma_t = 58 \text{ ps} / \sqrt{E(\text{GeV})} \oplus 135 \text{ ps}$



Neutron response of the ECAL is a key feature for SAND



KLOE-TO SAND Project OBS



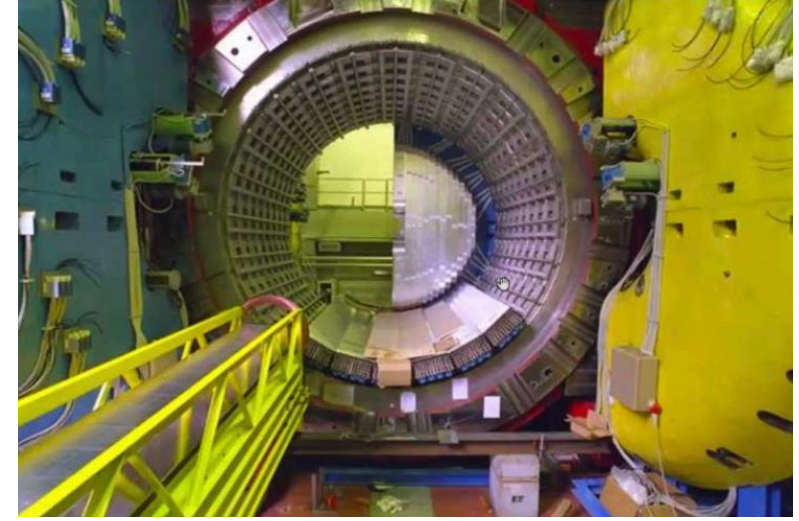
Extraction of Drift Chamber – done Winter 2022/2023



PL: A.Miccoli (INFN-LE)

KLOE-TO SAND Rough Operation List

- ✓ Removal of all the cables and the FEE+HV racks
- ✓ Extraction of the Drift Chamber
- Calorimeter
 - Extraction of Barrel (24 modules)
 - Dismounting of EndCaps
 - Operational test
 - Dismounting of PMTs
- Magnet and Yoke
 - Installation of new Power Supply
 - Cooling of coil
 - Operational test of magnet
 - Extraction of Magnet
 - Dismounting of Iron Yoke
- Packaging & Shipping



ECAL Dismounting – scheduled Autumn-Winter 2023/2024

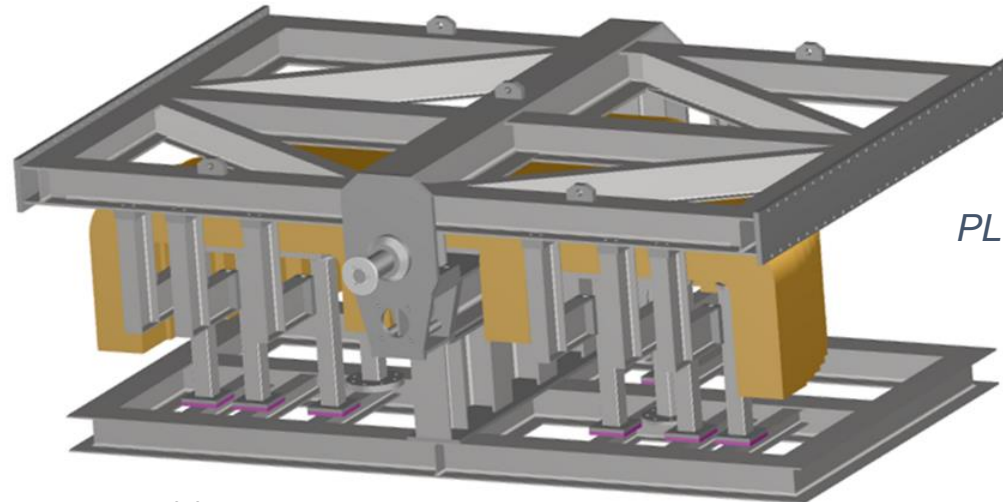
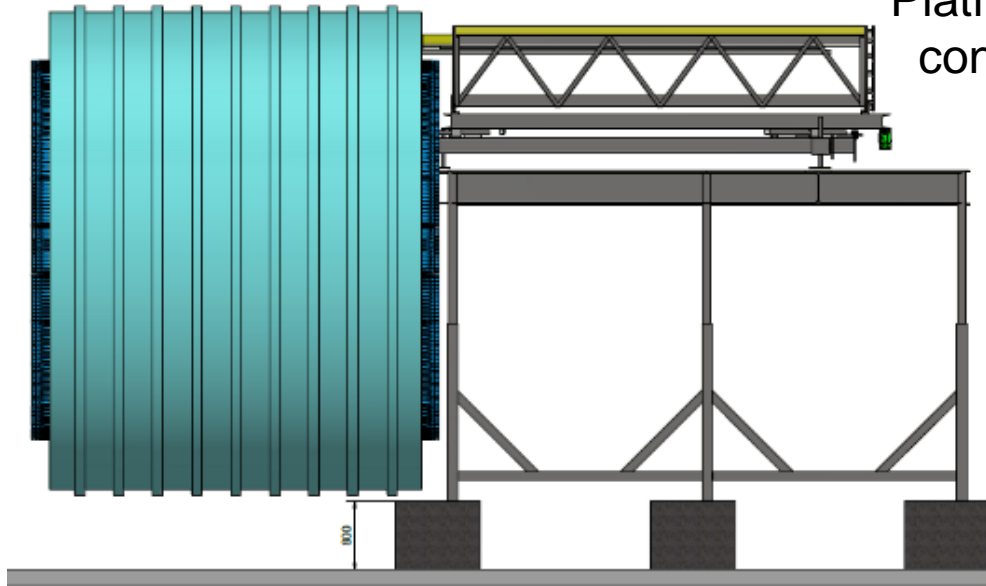


original
insertion/extraction
machine
completely
refurbished and
operational



original
insertion/extraction/rotati
on machine will be
refurbished and modified

Platform under
construction



PL: F.Noto (INFN-LNS)

Magnet Renovation – foreseen Q1-Q2 2024

New Power Supply

8 CAENels modules for 3000A - 20 V
REGUL8OR - TDK-Lambda Genesys+
customized with our interlock interface

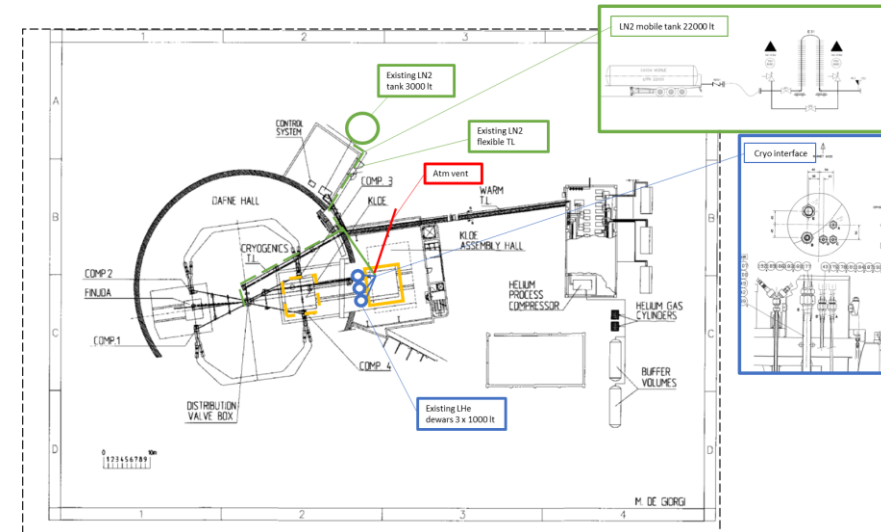


Power Electronics Revamping

Revamping of all parts compatible with
DUNE duration and replacing of obsolete
parts (dump resistance, discharge diodes,
crow bar, contactors) by OCEM

Magnet & Control System Test

ASG-Superconductors will be contracted to perform a full
check/revamping/certification of the magnet and provide
support for the dismantling at LNF and mounting at FNAL



Coil will be cooled down with LN₂ and LHe for
an operational test at low current is foreseen before
shipping also to test integration of all the parts
(PS, Quench Detector, Control System, Software Interface)



Magnet Extraction and Transport

Diameter 5.80 m
Length 4,40 m
Weight 42 t

Original tools not available.
Reverse engineering and design
of the cradles and all ancillary
parts is ongoing

PL: A.Saputi (INFN-FE)



Truck deck carpentry
to be extended/rebuilt



Sliding cradle on rails with cryostat
at few cm from ground

Transportation cradle
for truck load

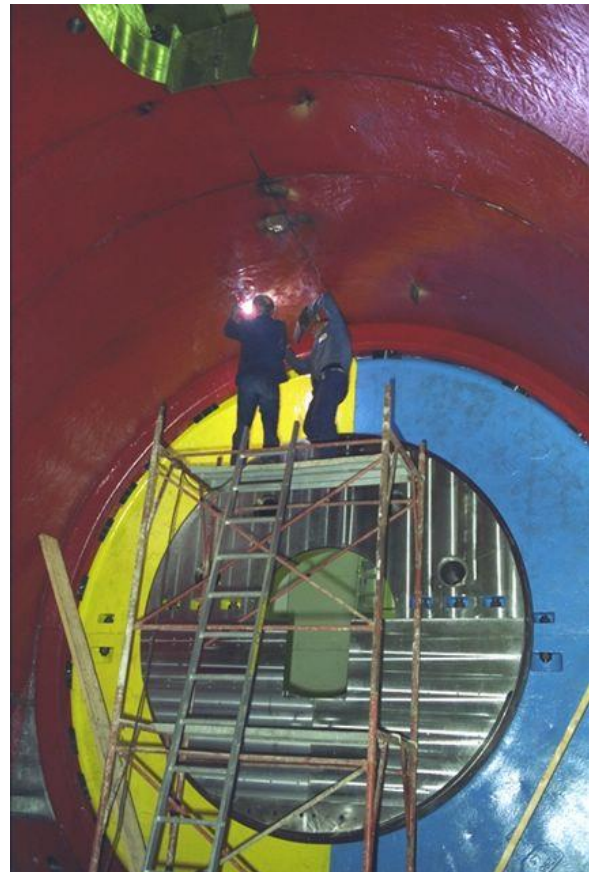


Iron Yoke Dismounting

Iron Yoke is made by 34 parts
the heaviest is 20t for a total of 700t

Unsoldering and heat treatment are needed
Strictly related with magnet extraction

PL: S.Gazzana (INFN-LNF)



Richieste economiche 2024 LNF

Item	Stima Costo	Capitolo	Richiesta
Nuovo alimentatore e Sistema di controllo del Magnete			
Sistema di potenza da 3000A 20 V REGUL8OR - TDK-Lambda Gen+ 20-375 (8 moduli TDK Lambda + regolatore CAENELS + DCCT	Preventivo CAENels	APPARATI	115k
Elettronica di potenza (i.e. resistenza di dump, diodi per l'inversione della polarità di corrente nella fase di scarica, crow bar, contattori)	Preventivo OCEM (da confermare dopo consegna del vecchio PS)	APPARATI	75k
Raffreddamento e Test del Magnete			
Fornitura di 6000 L di LHe	Stima a 20€/L	CONSUMO	120k
Estrazione del Magnete e Smontaggio Ferro			
Rifacimento/estensione campata del pontile carrabile + impalcato	Stima	CONSUMO	120k
Consulenza figure previste dal DLGS 81/08 (CSP, CSE, DL) per il rifacimento pontile e lo smontaggio ferro	Stima	SERVIZI	15k
Attrezzatura meccanica per l'estrazione e l'inserimento a FNAL (culla su binari)	Stima	CONSUMO	45k
Attrezzatura meccanica per il trasporto del magnete e della torretta (culla trasporto)	Stima	CONSUMO	40k
Accessori (cinghie, golfari, anelli orientabili, ecc.)	Stima	CONSUMO	10k
Noleggio gru mobile per carico/scarico magnete e yoke	Stima	SERVIZI	70k
Supporto ditta per smontaggio del ferro (Baldon)	Stima	SERVIZI	85k
Supporto ditta per smontaggio carpenteria e movimentazione carichi	Preventivo Architech Montaggi (300 gg-uomo)	SERVIZI	80k