

SAND – ECAL Working Group: introduction

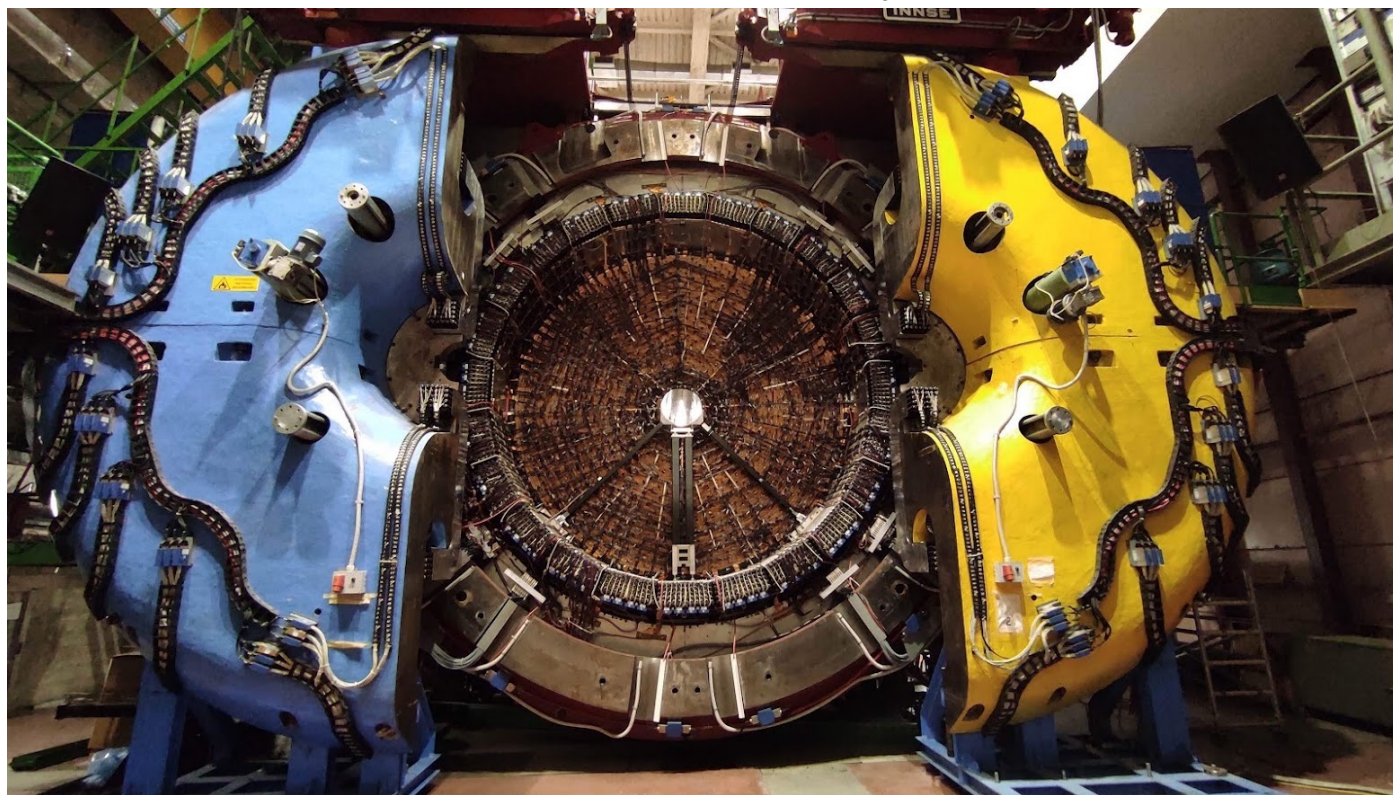
Antonio Di Domenico

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Danilo Domenici

INFN-LNF, Frascati, Italy



Meeting DUNE-Italia – LNF, 7 November 2022

- Activities related to the extraction of the electromagnetic calorimeter (ECAL) from KLOE detector, ECAL refurbishment, transportation to FNAL, installation and commissioning at the DUNE ND cavern.
- In general, the activities at LNF of the whole KLOE-to-SAND project are followed and discussed inside the ECAL WG, including the SAND/MAGNET WG activities due to the high correlation of operation and planning of the two WGs.
- WG chairs: A. Di Domenico, D. Domenici
- Dedicated mailing list DUNE-ND-SAND-ECAL@LISTSERV.FNAL.GOV
- Regular weekly meeting every Monday 2:15 PM (CET) – 7:15 AM (CT)
- Material presented and discussed during WG meeting available on Indico:
<https://agenda.infn.it/category/1684/> (from 7-FEB to 26-APR-2022)
<https://indico.fnal.gov/category/1413/> (since 2-MAY-2022)

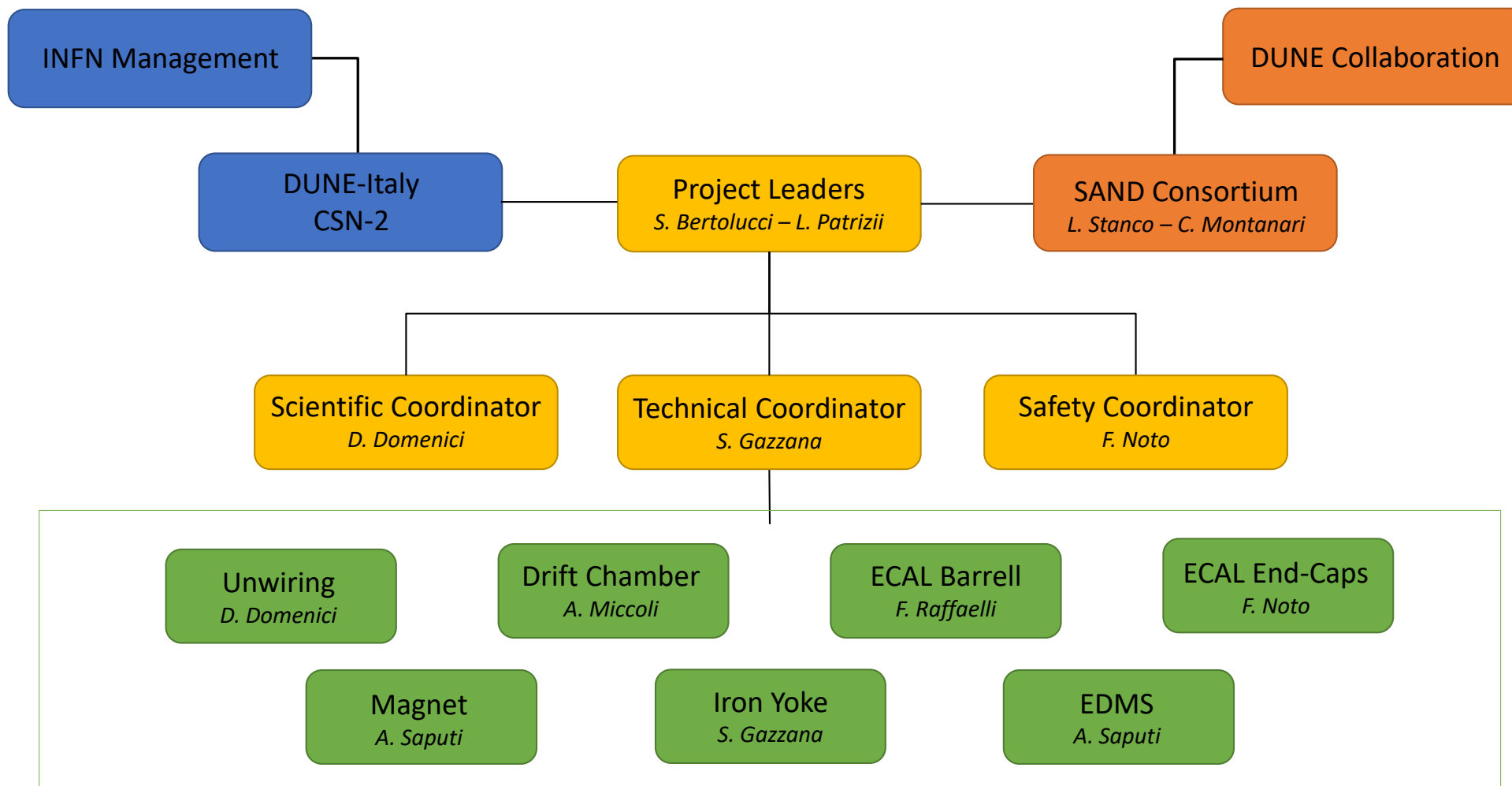
List of operations:

1. survey, revision and design of mechanical tools
2. Unplugging and cables removal, FEE removal
3. extraction of KLOE Drift Chamber
4. extraction of ECAL barrel modules
5. dismantling of ECAL endcaps
6. magnet test
7. extraction of coil
8. dismantling of iron yoke



KLOE-to-SAND: dismounting of KLOE

Organizational structure



Manpower

- huge efforts from 8 participating INFN institutions BO, FE, LE, LNF, LNS, PD, PI, RM1 in terms of technicians, and mechanical engineers.
- Constant presence of Architech montaggi personnel
- Constant presence of Carmelo Piscitelli (RM1) contributing to supervision and organization of the work
- For the unplugging and cables removal, and FEE removal, work for technicians from external institutions to LNF organised in weekly shifts (~40) from June to October 2022:

BO: Giulio Pancaldi, Vincent Togo, Luigi Degli Esposti

LE: Carlo Pinto, Massimo Corrado, Giorgio Rizzo

PD: Fulvio Calaon, Pier Giuseppe Zatti

PI: Luca Beretta, Filippo Mariani, Antonio Orsini

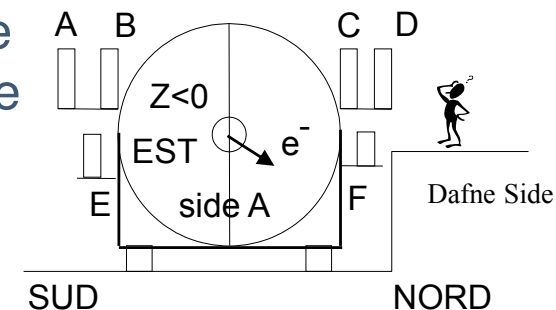
LNS: Claudio Calì, Maurizio Castro

RM1: Carmelo Piscitelli, Riccardo Lunadei

Unplugging and cables removal, FEE removal



32 racks, 150 crates, 3000 boards have been removed from the 6 platform aside the detector



cables removed

platform A and B once rack have been removed



Unplugging and cables removal, FEE removal



ECAL signal+HV cables
15+15 m long
in 12 storage boxes



KLOE-to-SAND: dismounting of KLOE

Photographic documentation:

Thanks to SIDS-LNF service (Elena Patrignanelli et al.) and Danilo Domenici a camera has been installed in the KLOE hall, shooting a frame every few minutes



Before shipping ECAL modules to FNAL we plan to:

- replace thin protective adhesive tape of the barrel modules
- check light tightness
- test basic performance with cosmic rays



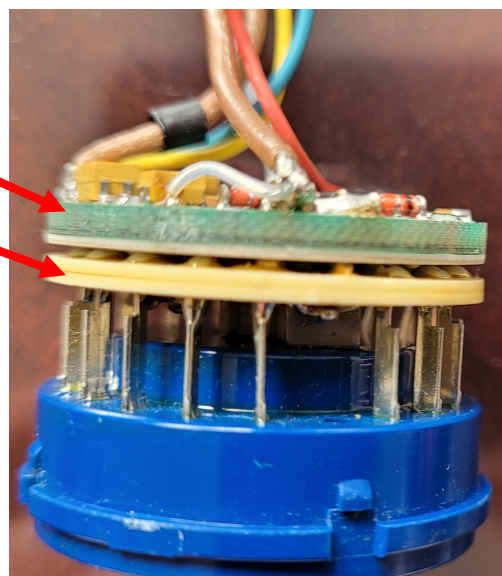
N.5 A7030P boards 48 Channel 3 kV/1 mA
N.1 SY4527B mainframe

ECAL Refurbishment and test:

1. 4880 Hamamatsu fine mesh PMT R5946-02 designed for KLOE;
2. 150 spare PMTs ordered at Hamamatsu; 60 already delivered at FNAL and 90 expected by the end of 2022;
3. Present PMT base – hosting divider and preamp – will most likely be modified substituting or removing the KLOE preamp => huge work needed
4. In general refurbishment and test of ECAL modules will require another big contribution from physicists and technicians (both mechanics and electronics) starting from 2023.



Many thanks to Alessandro Balla and P. Ciambrone to test preamp removal feasibility!!



KLOE-to-SAND time schedule



	2022												2023												2024																																						
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec																															
Safety Operation Documentation																																																															
KLOE Hall Housekeeping																																																															
Unplugging and Cables removal																																																															
- DC cables removal on platforms																																																															
- DC crates removal																																																															
- DC cables removal on plates																																																															
- Cryo pump, valve box, electric panel removal																																																															
- ECAL SDS to TDC cables removal																																																															
- Trigger cables and crates removal																																																															
- ECAL cables unplugging																																																															
- ECAL crates removal																																																															
- Racks removal																																																															
- ECAL HV+Signal cables removal																																																															
- Gas platform removal																																																															
DC Tooling Draw and Construction																																																															
Drift Chamber Extraction																																																															
ECAL Barrel Extraction																																																															
ECAL Module Test																																																															
ECAL EndCaps Dismounting																																																															
Coil PS and Cryo interface procurement																																																															
Coil PS Installation																																																															
Coil Test																																																															
Coil Extraction																																																															
Yoke Dismounting																																																															
Shipping																																																															

	2028												2029											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ND hall ready and available for detector installation																								
Starting Yoke, magnet and ECAL installation in ND hall																								

Agenda of the ECAL + Magnet WG sessions



16:15 → 17:45 ECAL WG

Conveners: Antonio Di Domenico (Istituto Nazionale di Fisica Nucleare) , Danilo Domenici (Istituto Nazionale di Fisica Nucleare)

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|-------|--|-------|
| 16:15 | ECAL WG Introduction | 🕒 10m |
| | Speakers: Antonio Di Domenico (Istituto Nazionale di Fisica Nucleare) , Danilo Domenici (Istituto Nazionale di Fisica Nucleare) | |
| 16:25 | KLOE-to-SAND: status of the activities | 🕒 20m |
| | Speaker: Stefano Gazzana (Istituto Nazionale di Fisica Nucleare) | |
| 16:45 | Extraction of KLOE DC: status report | 🕒 15m |
| | Speaker: Alessandro Miccoli (Istituto Nazionale di Fisica Nucleare) | |
| 17:00 | Dismounting ECAL barrel modules: status report | 🕒 15m |
| | Speaker: Fabrizio Raffaelli (Istituto Nazionale di Fisica Nucleare) | |
| 17:15 | ECAL FEE: preliminary simulation results and considerations for the choice of FEE | 🕒 15m |
| | Speakers: Antonio Di Domenico (Istituto Nazionale di Fisica Nucleare) , Paolo Gauzzi (Istituto Nazionale di Fisica Nucleare) | |
| 17:30 | ECAL with SiPM readout: final. results | 🕒 15m |
| | Speaker: Paolo Bernardini (Istituto Nazionale di Fisica Nucleare) | |

17:45 → 18:15 Magnet WG

Conveners: Giovanni Ottavio Delle Monache (Istituto Nazionale di Fisica Nucleare) , Ruggero Ricci (Istituto Nazionale di Fisica Nucleare)

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|-------|--|-------|
| 17:45 | KLOE Magnet test - Cryogenics | 🕒 15m |
| | Speaker: Giovanni Ottavio Delle Monache (Istituto Nazionale di Fisica Nucleare) | |
| 18:00 | KLOE Magnet test - PS | 🕒 15m |
| | Speakers: Alessandro Vannozzi (LNF) , Ruggero Ricci (Istituto Nazionale di Fisica Nucleare) | |