



# DAΦNE activity



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on behalf of the DAΦNE Team

*CS Meeting Jul 18<sup>th</sup> 2023, LNF, Frascati*



## Run Overview

*DAΦNE operations for SIDDHARTA-2 restarted by mid March 2023 after 8 months shutdown, that was used to recover full LINAC operability and to implement some maintenance intervention on the power supplies.*

*The first 10 days of operations have been spent to setup all subsystems, and to fix several faults.*

*Beams were stored for the first time at the end of March*

*Presently 180 pb<sup>-1</sup> have been delivered to the SIDDHARTA-2 experiment using the deuterium target.*

# Magnets & PSs

A fault peak on the IGBT drive board installed on the DanFysic PSs, thanks also to a synergy with the DR:

New spare parts are available

Tools and systematic methods for repair have been defined  
power in series symmetric quadrupoles of the two MRs.

Mending:

- PS power modules (driver boards, IGBT, water leak ..)
- Skew QUAD PS (FUG)
- UFS spare module (components must be provided)
- Accumulator magnet PS, several fault affected DHA\*001, QUA\*001, SXPA\*001 (frequent faults seem corelated to the PS hall high T.
- CHV in TL and TR Accumulator injection branches

*Provide spare PSs for:*

*C and L correctors 2-4 units, compatibility with CS*

*Skew Quads 1 unit*

*Consider the possibility to replace all or some of the CHV in the TLs  
equipment price are affordable ... manpower can be an issue.*

# LINAC

- Spare thyratrons,
- General maintenance of the RF plant control equipment, frequent interlocks interfere with operations
- Organize control access system replacement  
It could be done before restarting in 2024

# Control System

- Injector System Commutation procedure exhibits anomalous failure rate,
  - Add two more consoles in the Control Room,
  - Test tools to display SPARC based consoles on Linux consoles, in order to have the same monitor quality,
  - Implement some defined adjustments on the Control windows (fonts, size, names ...), on Linux consoles the RF phase is approximated to the integer;
  - Remove not used computers from the Control Room.
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- *Accumulator Closed Orbit acquisition*
  - *Complete tests on the old SWITCHES (thanks to R. Gargana more support is needed)*
  - *Obsolescence of DELL virtual Devils could be faced migrating control processes to other machines, if Computing Centre agrees and support.*

# Cooling and Fluid Systems

- General maintenance of all the systems: cooling towers, filters, resins.
- Cover with insulating tape the IR temperature probes
- Provide cooling towers with variable speed drive, in order to improve temperature stability, and reduce costs (100 - 150k€).
  
- **TLs**
  - Replace air hose of FL2TT002
- **LINAC**
  - Modulator tunnel
    - Replace the compressor of the air conditioning system
    - Replace a water pump
    - Compressor radiators
- **Accumulator**
  - Mending rooftop of the PS hall  
*(investing 200 k€ it would be possible replace the rooftop of the PS and DR halls, the intervention would last one month)*
- **Main Rings**
  - Repair and reinstall spare water pump,
  - mending one of the six water pumps,
  - replace bearings of the spare cooling tower,
  - complete the downgrade of the DAFNE hall air conditioning systems (six circuits)
  - It's worth reminding that the system should keep the hall temperature at  $23^{\circ} \pm 0.5^{\circ}$ , but presently manage to keep, at best,  $25^{\circ} \pm 0.5^{\circ}$ .

# RF Systems

*Mending the tuner of the Accumulator RF system:  
water leakage identified  
radioprotection controls under way to move the  
component outside for repair*

*Procure spare parts for the solid state amplifier, used  
device is no longer in production.  
It would be wise to buy a new amplifier also in view of  
possible problems with the MRs RF apparatus.*

# Diagnostics

- Thyatron for injection/extraction KCKs (for six months?)
- Flags maintenance
- Restore operation of the Accumulator tune measurement
  
- ICE PS overhaul

Critical components:

Feedbacks amplifiers

DCCT front end

Spare volmeter ( only 1-2 )

Timing system

Video-camera six spare

# Mechanical

- Install lead shields in the aperture of the unused compensator solenoids.

# Vacuum

Modify the stroke of the collimators upstream the IP  
Add two new T probes on the PMQDs

*Setup a strategy to face a possible fault in one of the absorbers (14 different kind )*

*Provide copper bulk to be machined (it can be reused for other activities)*

*Rebuild tool to machine copper block;*

*Design a new vacuum chamber for the collimators in order to increase blade insertion.(intervention one month).*

# DAΦNE hall

- Remove garbage
- Remove TEX large box ( had to be there for a week)

# Possible Schedule

- Radioprotection periodical controls scheduled on September 18<sup>th</sup>

It implies that on the previous week:

Ancillary systems must be ready, overhaul completed

the DAFNE Accelerator complex should start warmup

# Operation Group

The DAΦNE Operation Group → **LNF Accelerator Operation Group**

The **DAΦNE Operation Group** was taking care of activities on the DAΦNE collider, BTF (only 1 line) and, seldom in crucial context, of the SPARCLab activities.

The **LNF Accelerator Operation Group** takes care of the DAΦNE collider, BTF (2 line), of the SPARCLab activities, and TEX.

Shifts relies on 7 crews of 4 people, presently Operation Group includes:

**27** members (1 missing)

will become **26** on Next September

**25** by the end of October

# DAFNE Run Coordinators

Di Giulio Claudio	LINAC and BTF only
Foggetta Luca	LINAC and BTF only
Buonomo Bruno PR	LINAC and BTF only
De Santis Antonio PR	
Liedl Andrea PR	
Franzini Giovanni PR	
Piersanti Luca PR	
Spampinati Simone	
Ciarma Andrea	
Boscolo Manuela	
Zobov Mikhail	
<i>Bilanishvili Shalva</i>	
<i>Alesini David</i>	
<i>Behtouei Mostafa</i>	
Vannozzi Alessandro PR	
<i>Etiksen Ozgur</i>	

# DA Secretariat

Support for Fondi FAI procedures to host two people (with the kind support of the INFN Director) in the period October – December 2023.

*Grazie per l'attenzione*