REPORT FROM LNF

Fabio Bossi – LNF

107 PECFA Meeting, November 19, 2020

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Laboratori Nazionali di Frascati

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Period from March 2020 dominated by Covid19 crisis.
Four phases:

A. 8 March – 4 May: Full Lockdown
B. 4 May – 15 September: Mild re-opening
C. 15 September – 30 October: Mild Recovery Phase
D. 30 October – now: New partial slow-down

A. Only «basic services» guaranteed about 10% personnel on site
B. About 30% personnel on site. Only strategic activities allowed
C. 50% → 70% personnel on site (*). Restart of all activities
D. < 50% personnel on site. Only strategic activities guaranteed

(*) in order to guarantee safe social distancing

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We have elaborated a plan for the allocation of the available resources with clear short-term priorities

Accelerator activities are the core business of LNF

For this reason, the technical staff of the DA has been kept on site more than the LNF average; it was at the level of 70-80%, during period C, now ~ 60%

Shifts and technical support to the internal experimental activities have been guaranteed during all periods B-D

Two running accelerator facilities

DAFNE and BTF system

SPARC_LAB

BTF operation and BTF2 installation

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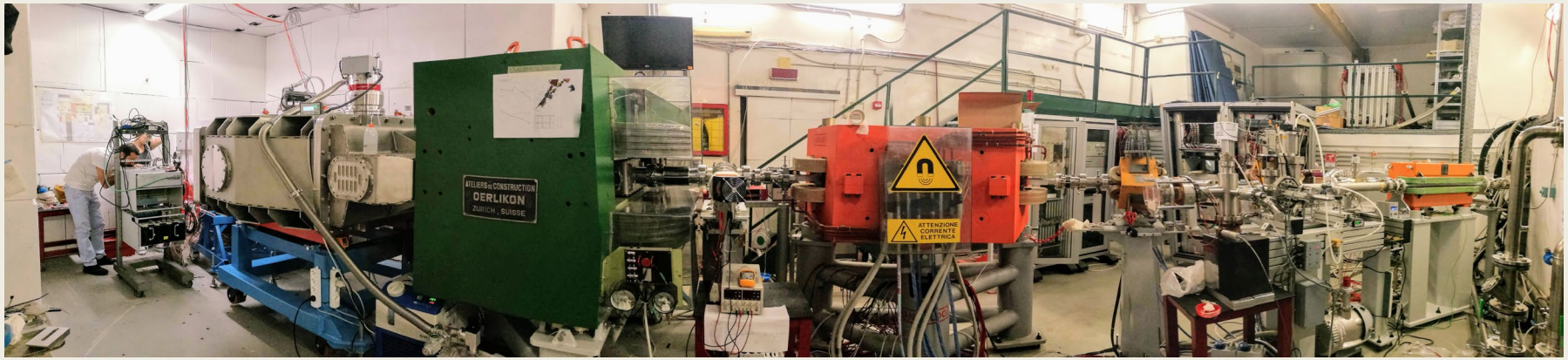
All activities shifted by two months due to period A stop

After that, facility operated according to the schedule

- May-June: BTF1 line recovery
- June-July: PADME engineering run
- September-present: PADME physics run. Dead-line: November 30

Safety limit set to 6 persons in DAFNE CR; 3 operators per shift + possible Linac experts, all with FFP2 masks.

BTF2 installation and DAFNE 2021 run preparation scheduled to start after PADME run end. Collider operation scheduled to start in January 2021



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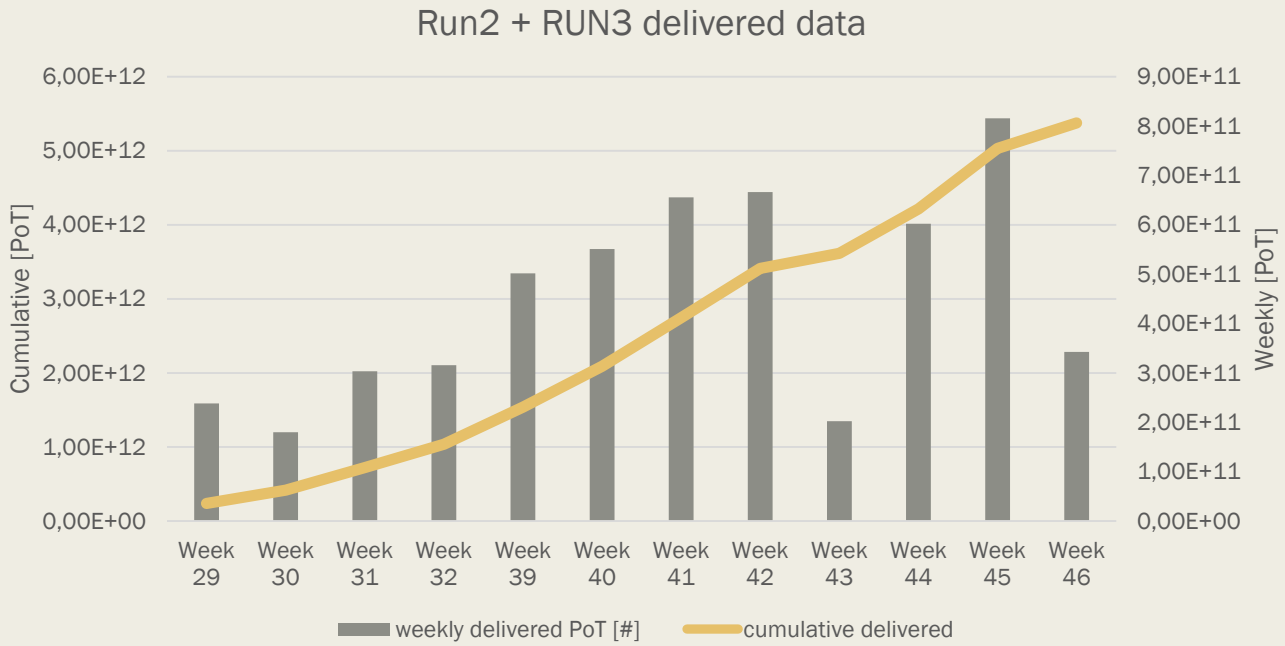
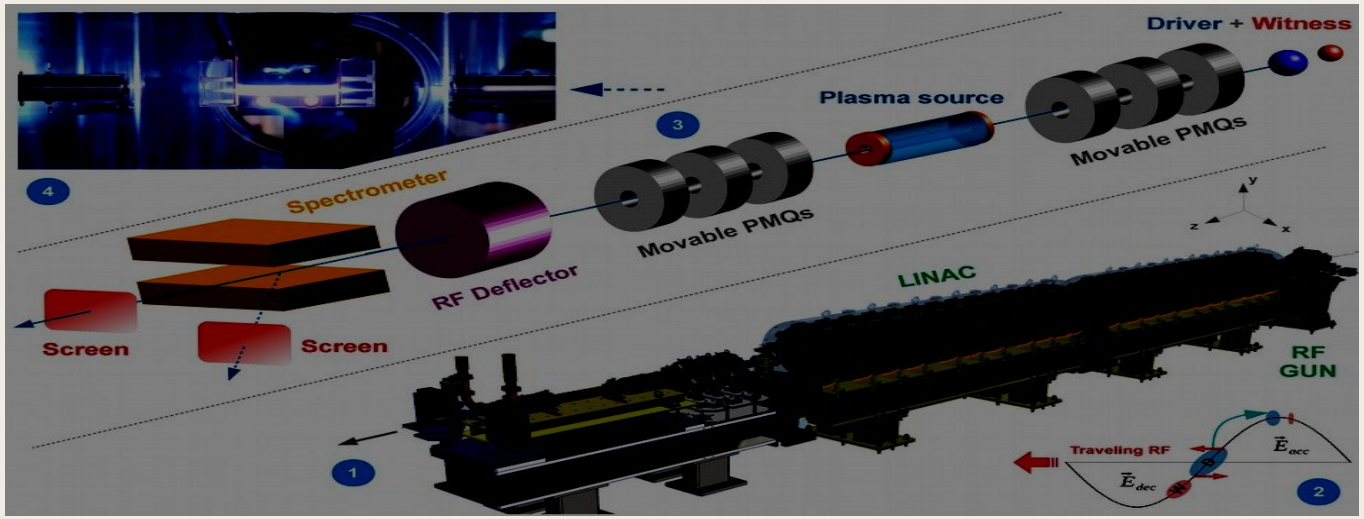


- Declared goal: $5x10^{12}$ POT
- Present acquired luminosity: $4.1x10^{12}$ POT
- Goal reached by the end of November

SPARC_Lab operation



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First results on plasma acceleration obtained just before first lockdown

All activities shifted by two months due to period A stop

After that, experiments slowed-down by limited access for operators. Limit set to 3 people in SPARC CR. Still:

- July-August: complete characterization of accelerated witness
- September-present: preparation for new experiment

SPARC_Lab operation

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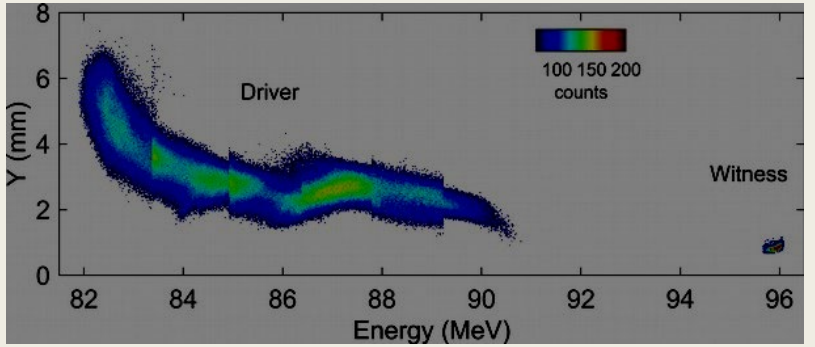
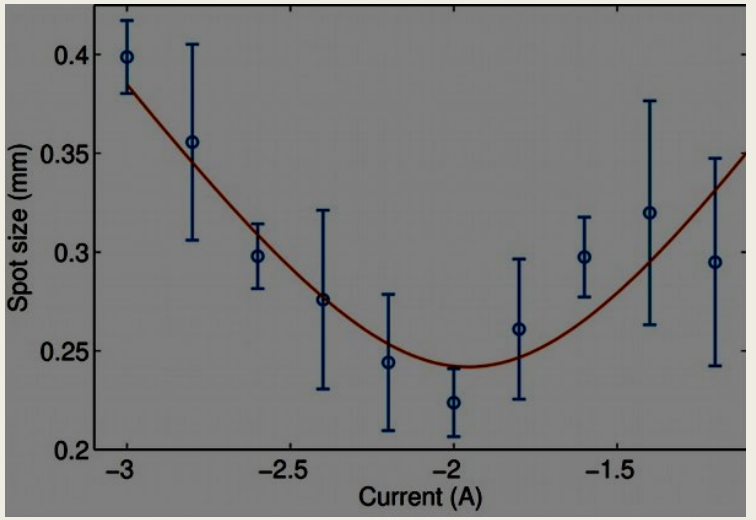
- Obtained 7 MeV acceleration in 3 cm plasma with 350 pC driver
- ~ 233 MV/m accelerating gradient
- Energy spread of 0.26%, still orders of magnitude lower wrt previous experiments
- 99.4% energy stability
- Emittance of 3.7 μm (rms) during acceleration
- Now preparing for transport to undulators for FEL emission experiment





Eupraxia project

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Operation of SPARC_LAB are preparatory to our next big challenging enterprise: Eupraxia@SparcLab

- Work on the design of the new building ongoing: final design expected for the end of 2020
- ESFRI application submitted on September 9, 2020. Outcome expected by summer 2021
- Political support obtained from Italy (lead country), Czech Republic, Hungary, Portugal, UK
- Financial commitment from Italy (108 M€)
- Consortium agreement signed with 38 Institutes and 10 observers, to proceed with the technical studies

More details in tomorrow's talk by R. Assmann

ACTIVITIES AT/FOR OTHER LABS

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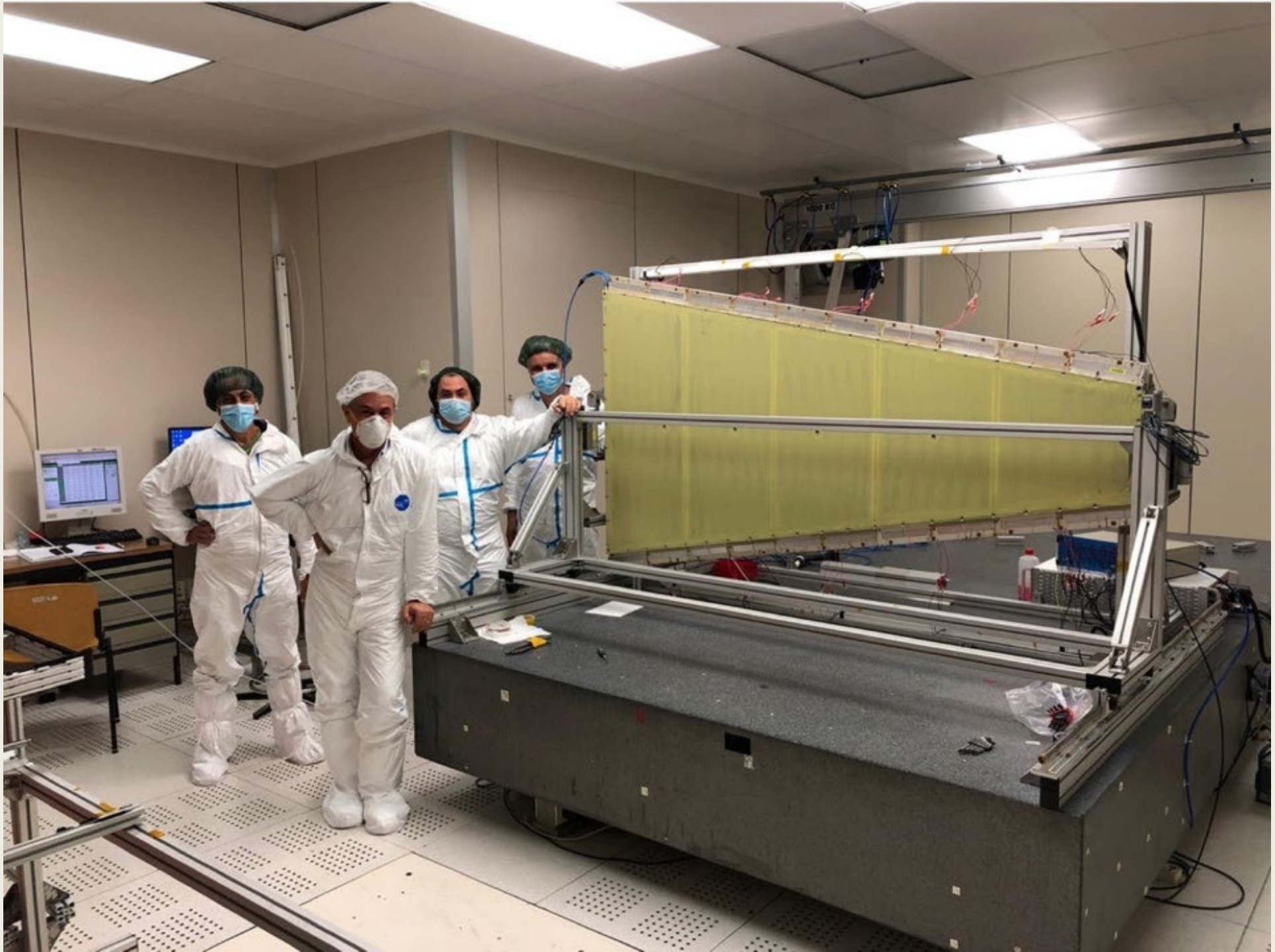
Support to external experiments (in particular the LHC ones) is the other major pillar of LNF Science

Despite a reduced presence of personnel (we reached a maximum of 50% of non-DA personnel on site) we were able to complete some important construction work, most notably a relevant part of the new muon forward spectrometer of the ATLAS experiment

We are also regularly (albeit cautiously) sending scientific and technical personnel at CERN for essential installation work for ATLAS, LHCB, ALICE, CMS, NA62



OUTREACH AND DISSEMINATION

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Our Education and Public Outreach Service makes routinely use of many popular web communcation channels (Facebook, YouTube, Instagram..) so the present pandemics did not affect our dissemination effort

5 march

PARTICLE LAND
Partner: Presidenza INFN

1 lezione dal Bruno Touschek Visitor Centre
990 persone connesse in live

30 march – 3 april

INSPYRE
International School on modern Physics and REsearch
ONLINE EDITION

Scuola internazionale di fisica moderna
Partner: FrascatiScienza

10 lezioni in lingua inglese
circa 150 partecipanti durante la live

Relatori: ricercatori LNF e di altri enti

april - may

RESEARCHERS @HOME

6 lezioni
In media 500 spettatori durante la live

Relatori: ricercatori LNF

6-10 July

Bambini 8-10 anni
Le mie GigaNano vacanze estive
Partner: Rai Radio Kids

10 lezioni
In media 30 spettatori durante la live

Relatori: ricercatori LNF e di altre sezioni INFN

All in all we have posted about 60 videos in the first 10 months of 2020

CONCLUDING:

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- We have tried to minimize the impact of the Covid-19 crisis on our science production by identifying high-priority activities and putting all available manpower on them
- Unavoidable delays in our programs of 0(2-3 months) due to phase A lockdown
- Still, amazing physics results have been obtained
- We look forward to doing even better during a hopefully brighter 2022!