

Osservatorio Pierre Auger - News



Antonella Castellina

INFN Sezione di Torino & OATo/INAF Torino, Italy

Roma, 5 Luglio 2024

Activity in 2024

➔ Elezione dei nuovi chairs del Collaboration Board

precedenti: Lorenzo Perrone (chair) e Federico Sanchez (co-chair)

Nuovi eletti: Federico Sanchez (chair), Juian Rautenberg (co-chair)

➔ Modifiche per i task di analisi e management

Rossella Caruso - responsabile per le tensioni FD (FD Electronics task)

Denise Boncioli - nuova coordinatrice scientifica

Armando di Matteo - task leader per la Fenomenologia

Confermati

Francesco Salamida coordinatore per il rivelatore FD

Lorenzo Caccianiga task leader Arrival Directions

Roberta Colalillo e Roberto Mussa task leaders Cosmogeophysics

➔ Modifiche nel Publication Committee

Laura Valore

➔ Nuovi Ombudspersons

Pedro Assis and Carola Dobrigkeit

➔ Impact Award

Eva Santos e Jorge

➔ Nuovi rappresentanti dei giovani ricercatori

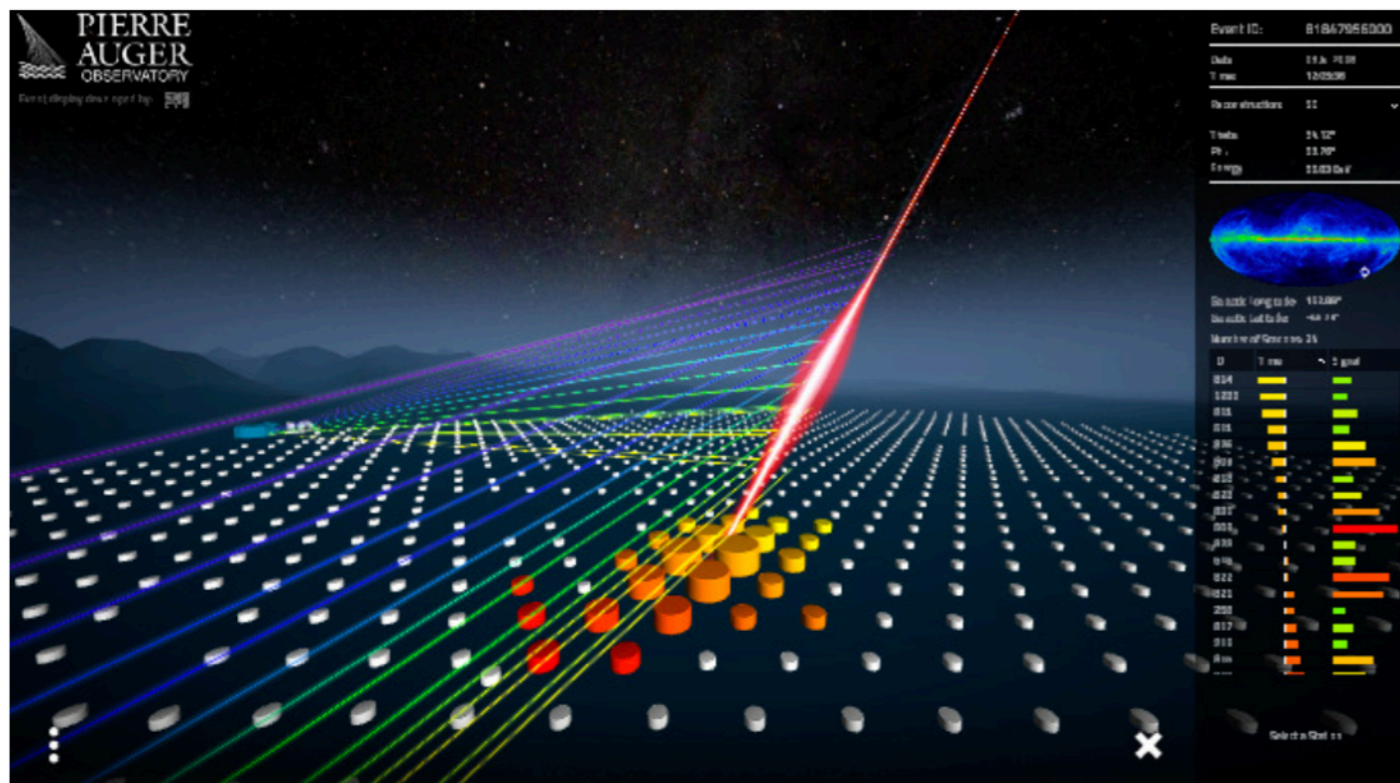
Fabio Convenga e Katarina Simkova

Data release

Data release extended for 2024:

- 2021, February: 10 % vertical ($0^\circ - 60^\circ$) SD1500 and hybrid (SD1500 & FD) well reconstructed events (from the ICRC2019 dataset)
- 2021, October : 100% weather and space-weather data collected until 31 December 2020
- 2022, December : 10% SD1500 inclined ($60^\circ - 80^\circ$) well reconstructed events (from the ICRC2019 dataset)
- **2024, March :** **10% SD750 ($0^\circ - 40^\circ$) well reconstructed events (~55000 events from the dataset used in Eur. Phys. J. C81, 966 (2021)) + the hybrids (~200) used for calibration**

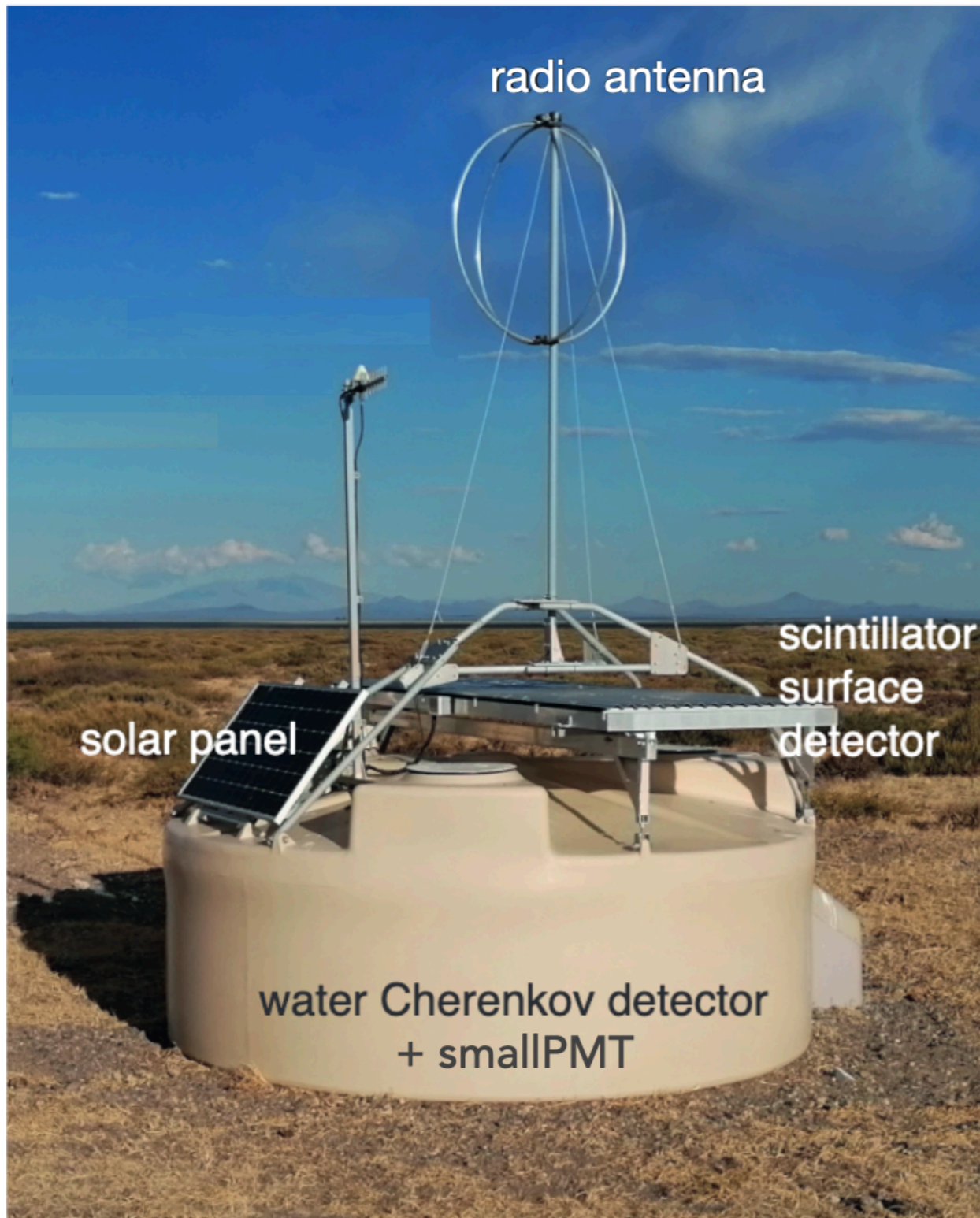
With updates of Spectrum and Calibration notebooks



<https://opendata.auger.org/>

<https://zenodo.org/records/10488964>

AugerPrime - i rivelatori



- ➔ AugerPrime preliminary Design Report (2016) arXiv:1604.03637
- ➔ AugerPrime: the Pierre Auger Observatory Upgrade, UHECR2018, EPJ Web of Conf. 210 (2019) 06002.

➔ Report for the AugerPrime Review 2023 non pubblicato - fornito ai reviewers

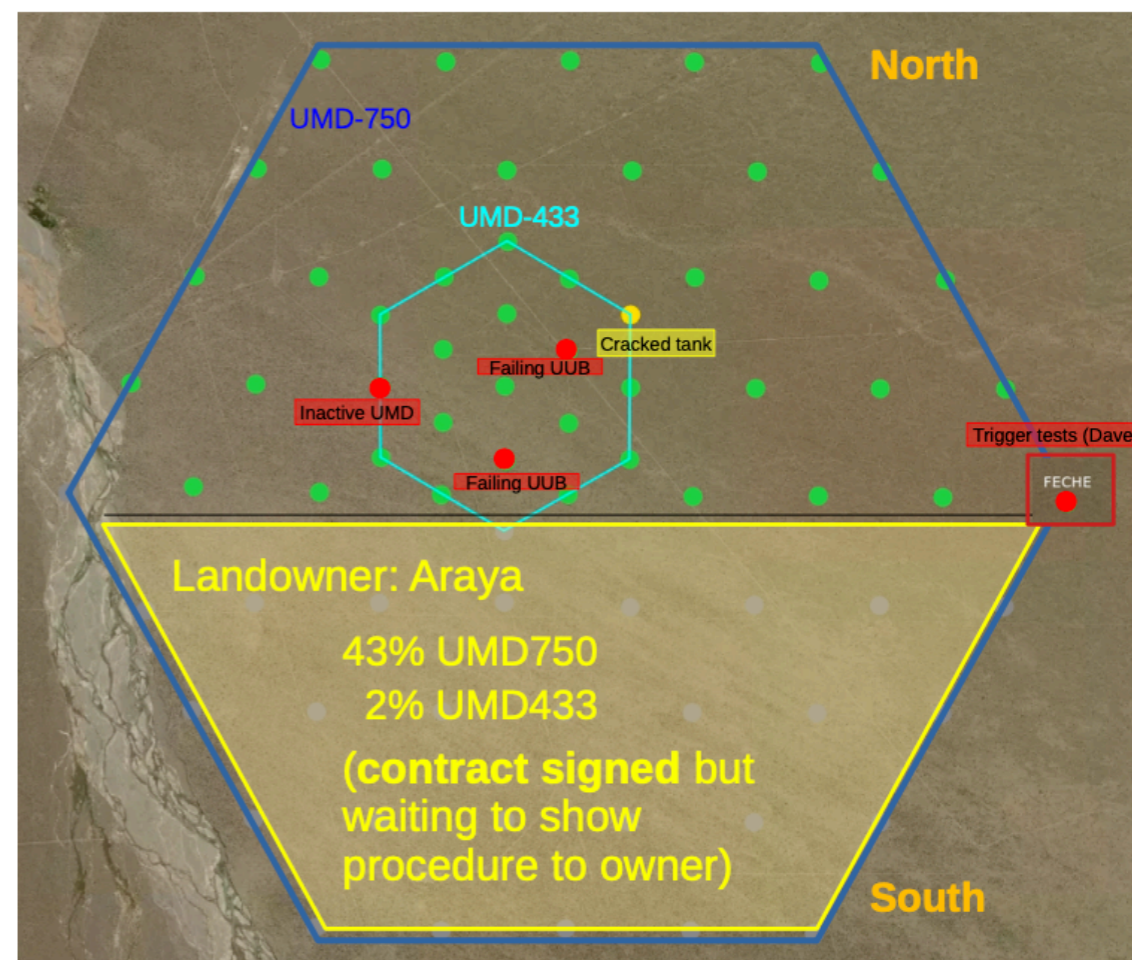
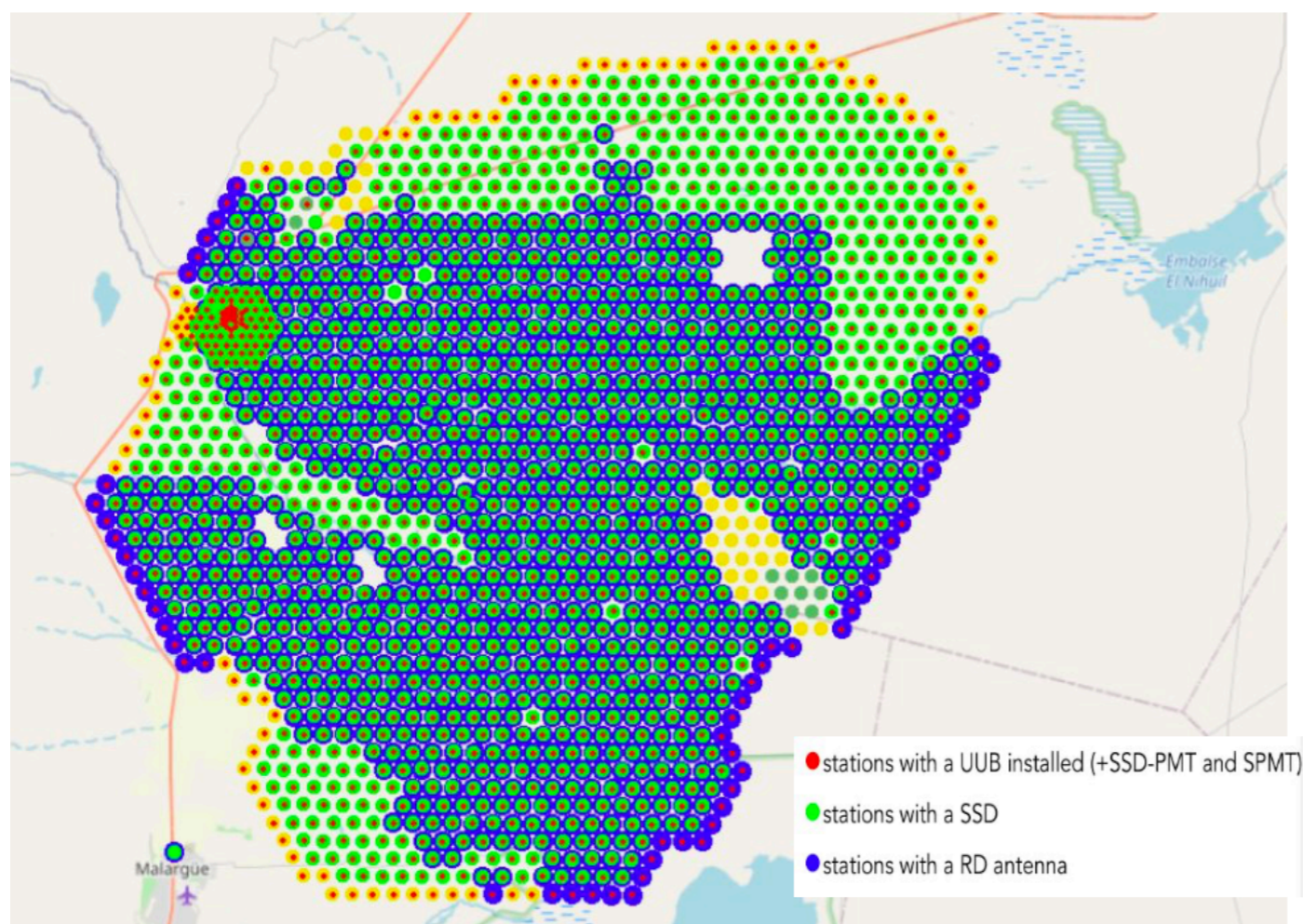


Installazione

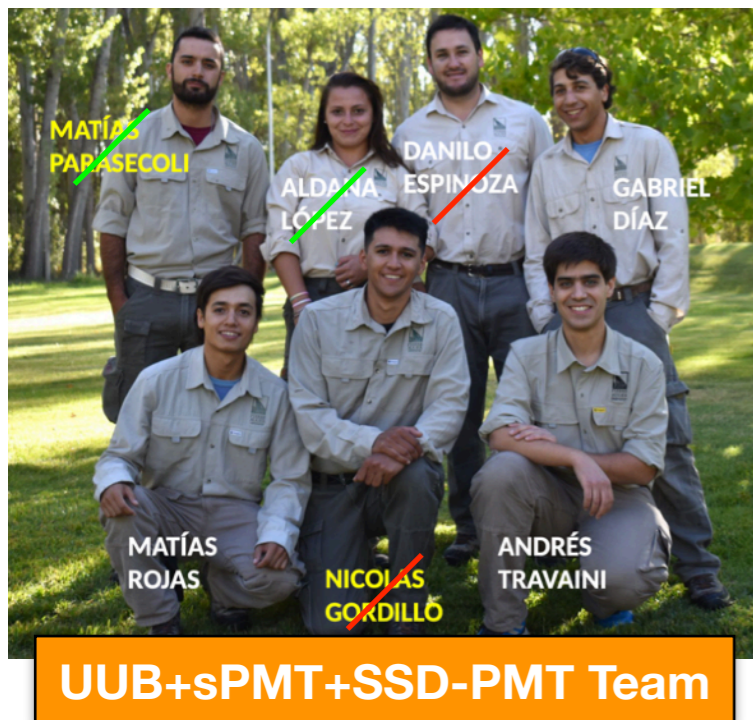
	<i>installazione</i>	<i>Staff locale</i>	<i>completamento</i>	<i>In presa dati</i>
<i>UUB</i>	1625		✓	✓
<i>SPMT</i>	1477 [esclusi bordi]		✓	✓
<i>SSD</i>	1444 [esclusi bordi]		✓	✓
<i>RD</i>	1062/1493	6	Summer 2024	~600
<i>UMD</i>	45/73 [SD750+SD433]	7	Feb 2025	~40

RD:
7 antenne/giorno
7 digitizers/giorno - lentezza spedizioni


UMD:
4200 barre di scintillatore ordinate (FNAL)
100 eKits ordinati (KIT)




Staff




COORDINATORS



Ricardo Sato
Science Operation



Fabian Gobbi
SD Observer



Anton Moroz
FD Observer

➔ staff UUB=3 persone (2 passate a RD, 2 perse)

➔ Avremo un nuovo FD Observer:
Yosel Balibrea Lastre (da Cuba)

➔ Stiamo valutando le applicazioni per un posto da
Computing Expert

Safety:

Formazione di tecnici per il funzionamento delle gru e la manutenzione delle antenne, in futuro per la manutenzione delle linee elettriche

Commissioning (“bring (something newly produced) into working condition”)

AugerPrime SDEU F2F Meeting

3 giu 2024, 14:00 → 5 giu 2024, 16:00 Europe/Paris

100/0-A015 - Salle A015 (IJCLab)

Martin Schimassek, Tiina Suomijärvi

Descrizione We invite you to a face-to-face meeting on the SDEU commissioning in Orsay, France.

Lunches will be organized for Tuesday and Wednesday. Please, indicate in the registration if you plan to join for these, they are free of charge.

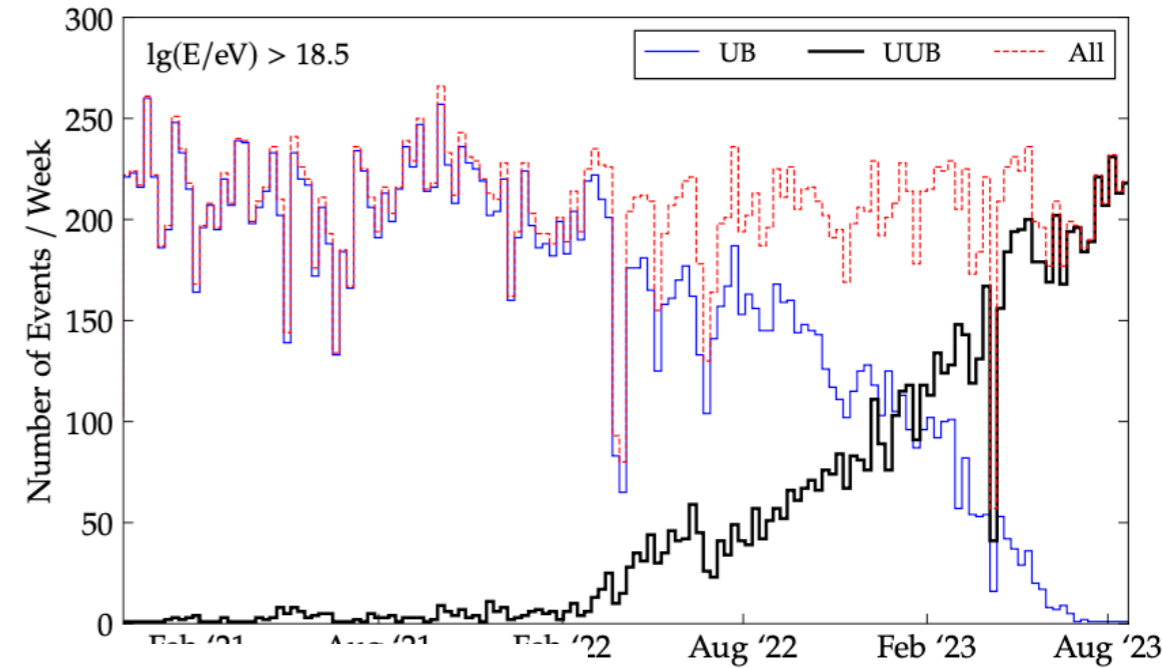
For instructions on how to reach the laboratory, see <https://www.ijclab.in2p3.fr/en/ijclab/practical-information/>

The meeting will be held in the Building 100, Room A015, [map](#).

université
PARIS-SACLAY
GRADUATE SCHOOL
Physique

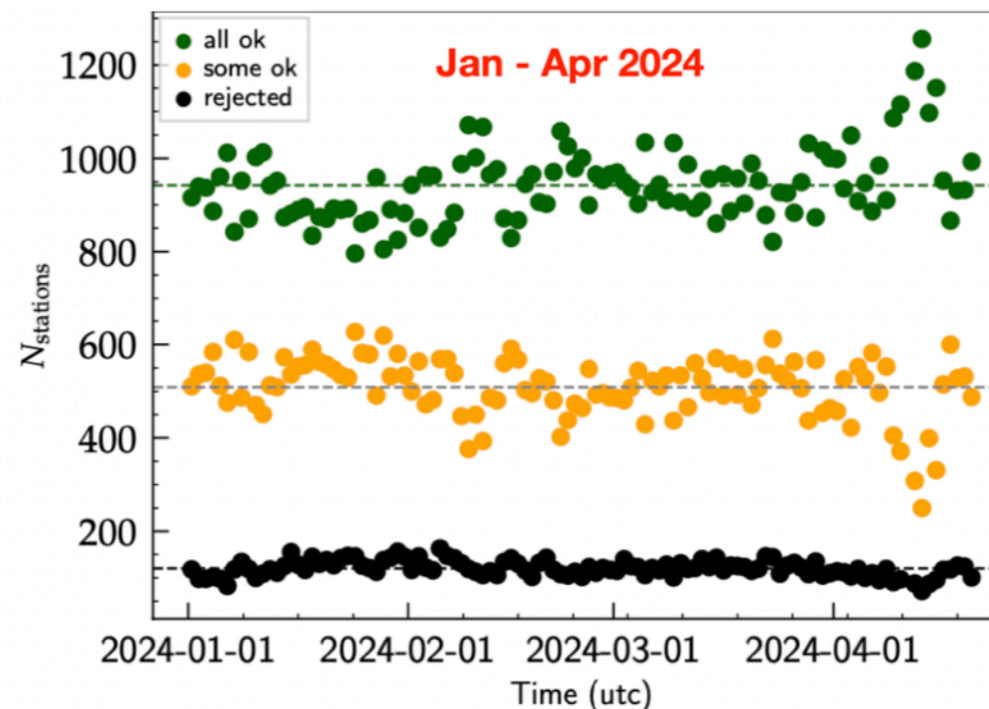
P2I

Physique des
deux Infinis

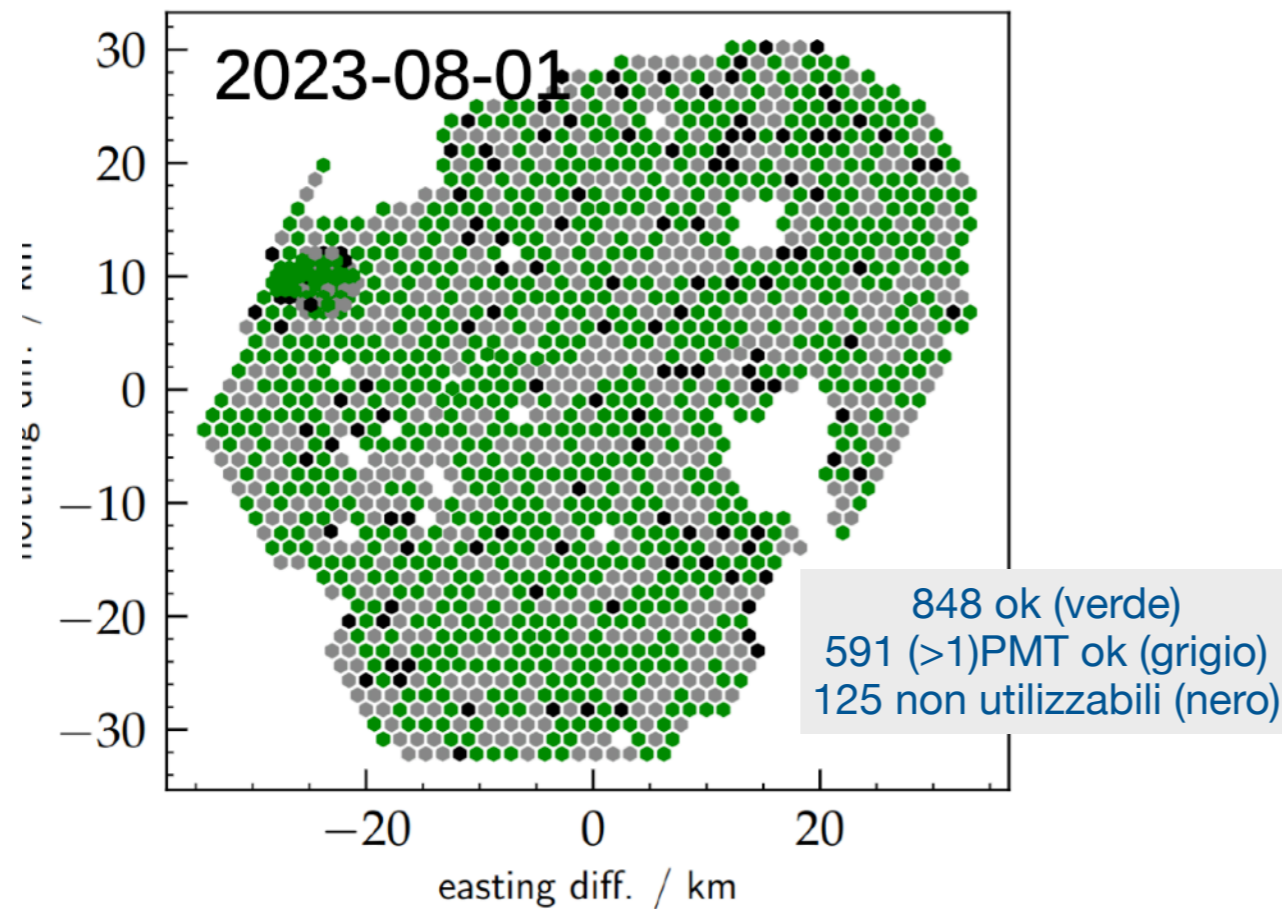


Status

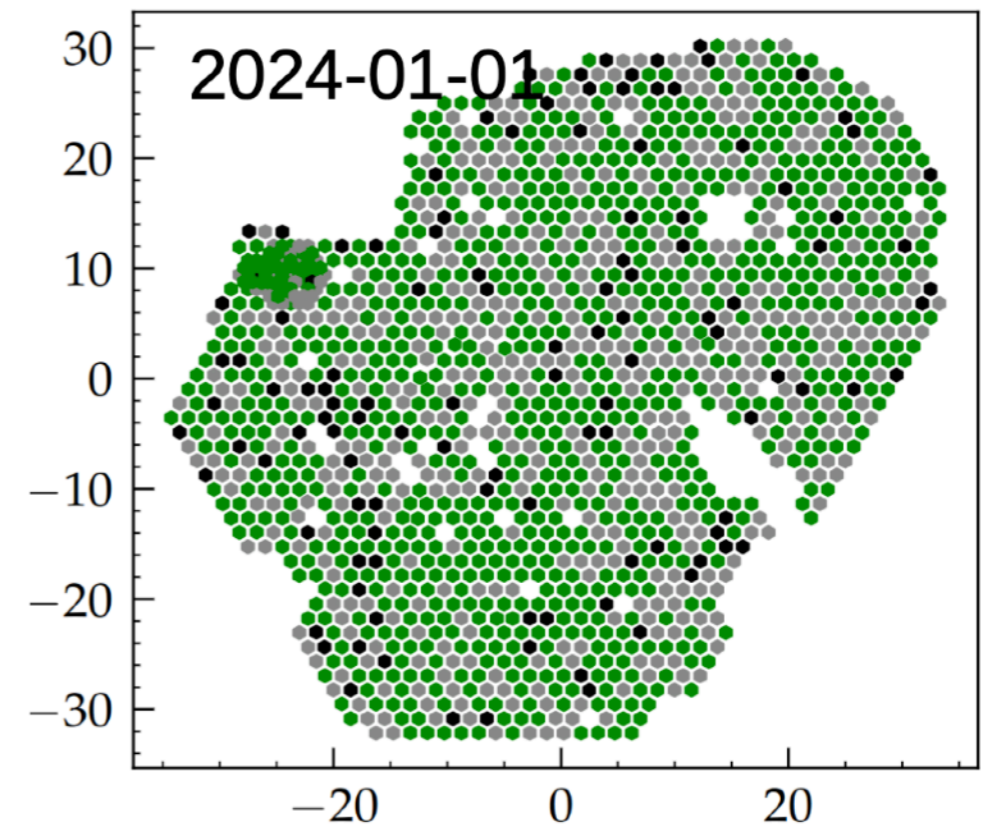
- Method used for Phase1-like daily commissioning has been **adapted to Phase2 monitoring-data**
- Sensible parameters to detect anomalous PMTs/channels/stations have been identified: **mask, baselines, VEM peak and charge, HG/LG ratio, ToT rate**
- **Preliminary criteria for alarms** have been defined and proposed
- **Tools are ready to be used** to run the daily commissioning (see figure on the right)
- From an analysis over 4 months, **the number of identified anomalies look stable**



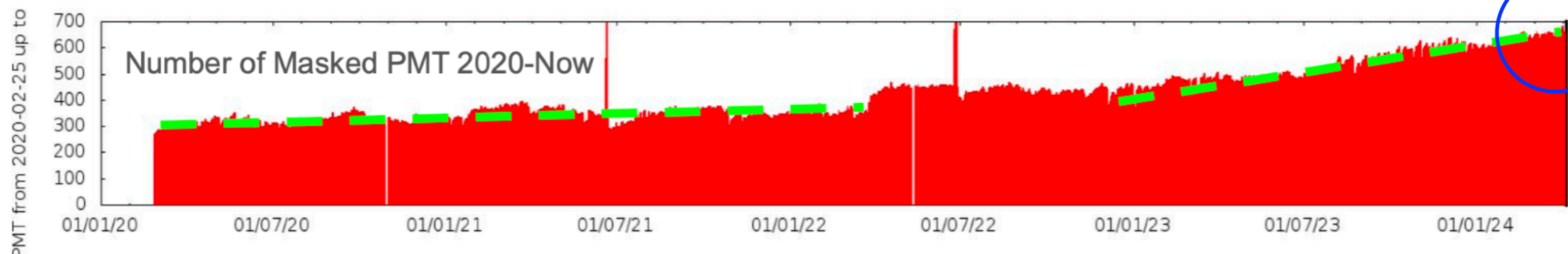
Commissioning (“bring (something newly produced) into working condition”)



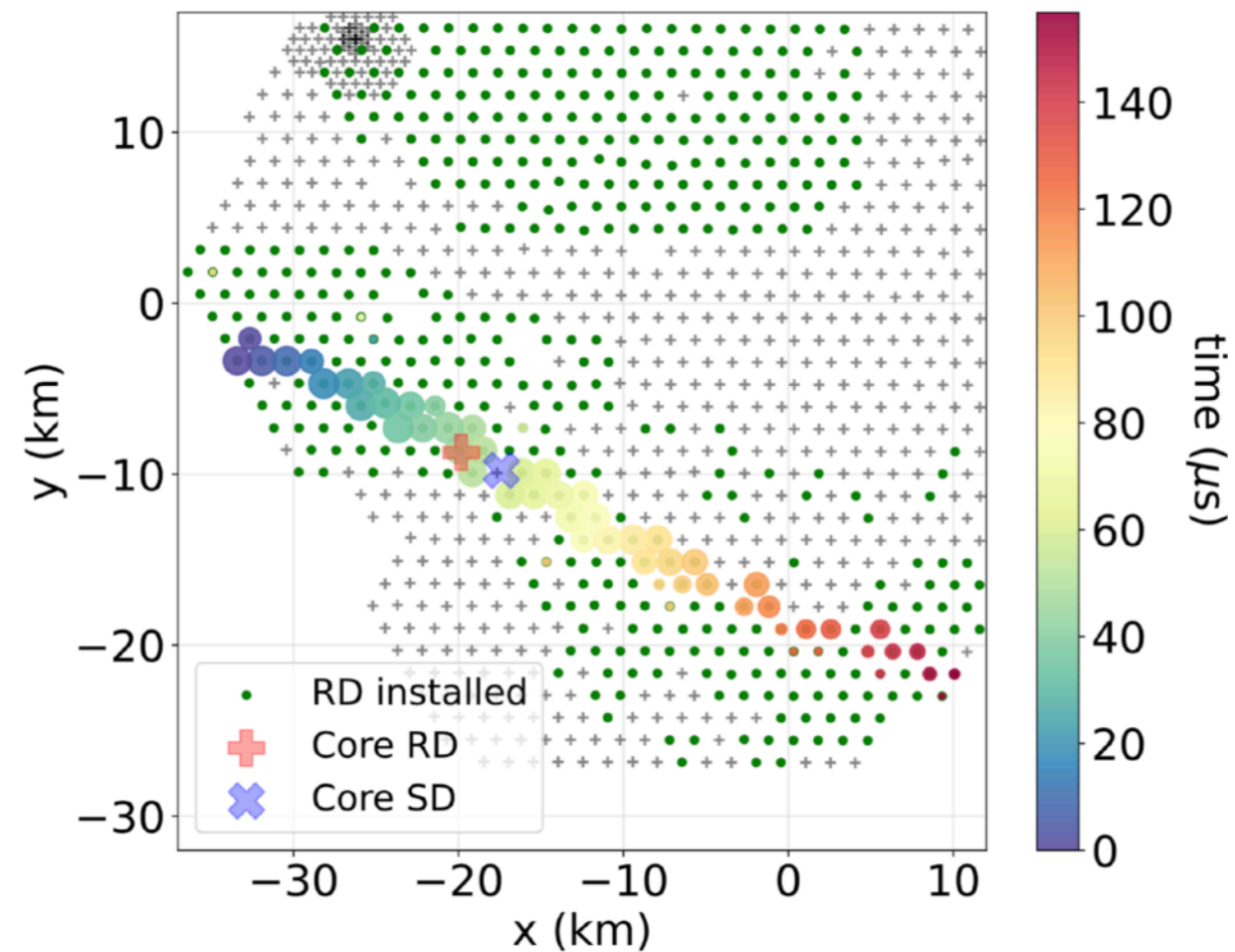
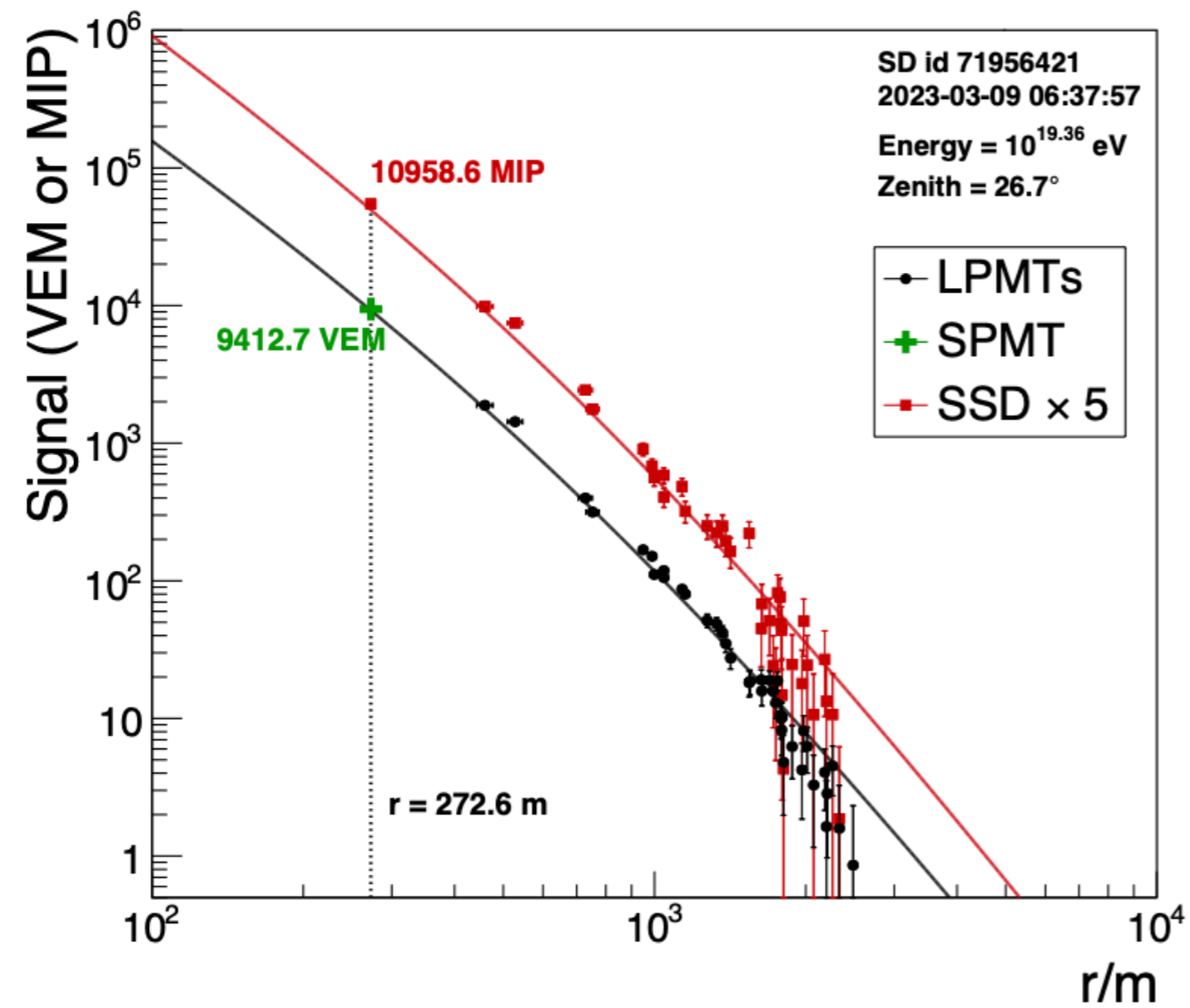
848 'ok'



911 'ok'



Il maintenance dei large PMT (~5000) è fondamentale per il commissioning di AugerPrime e per l'intercalibrazione dello small PMT



Inclined event in radio

	RD	SD
Azimuth (deg)	156.99 ± 0.01	157 ± 0.1
Zenith (deg)	84.7 ± 0.01	84.7 ± 0.1
Energy (EeV)	36.23 ± 3.34	38.55 ± 2.92
Core X (km)	-19.8	-17.40 ± 0.88
Core Y (km)	-8.73	-9.78 ± 0.45

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PIERRE
AUGER
OBSERVATORY

Report for the AugerPrime Review 2023

Pierre Auger Collaboration

September 30, 2023

Submitter: Pierre Auger Collaboration
Observatorio Pierre Auger,
Av. San Martín Norte 304,
5613 Malargüe,
Argentina

Comitato Internazionale di 8 membri

Chair: Francis Halzen

Paolo Lipari e Bruna Bertucci per INFN

Review

Settembre 2023: Review di AugerPrime per i membri del Comitato

Novembre 2023: visita del Comitato all'Osservatorio e presentazioni

First notification at November FB:

"We ... unanimously and enthusiastically recommend to continue the experiment for at least ten years after 2025."



AugerPrime

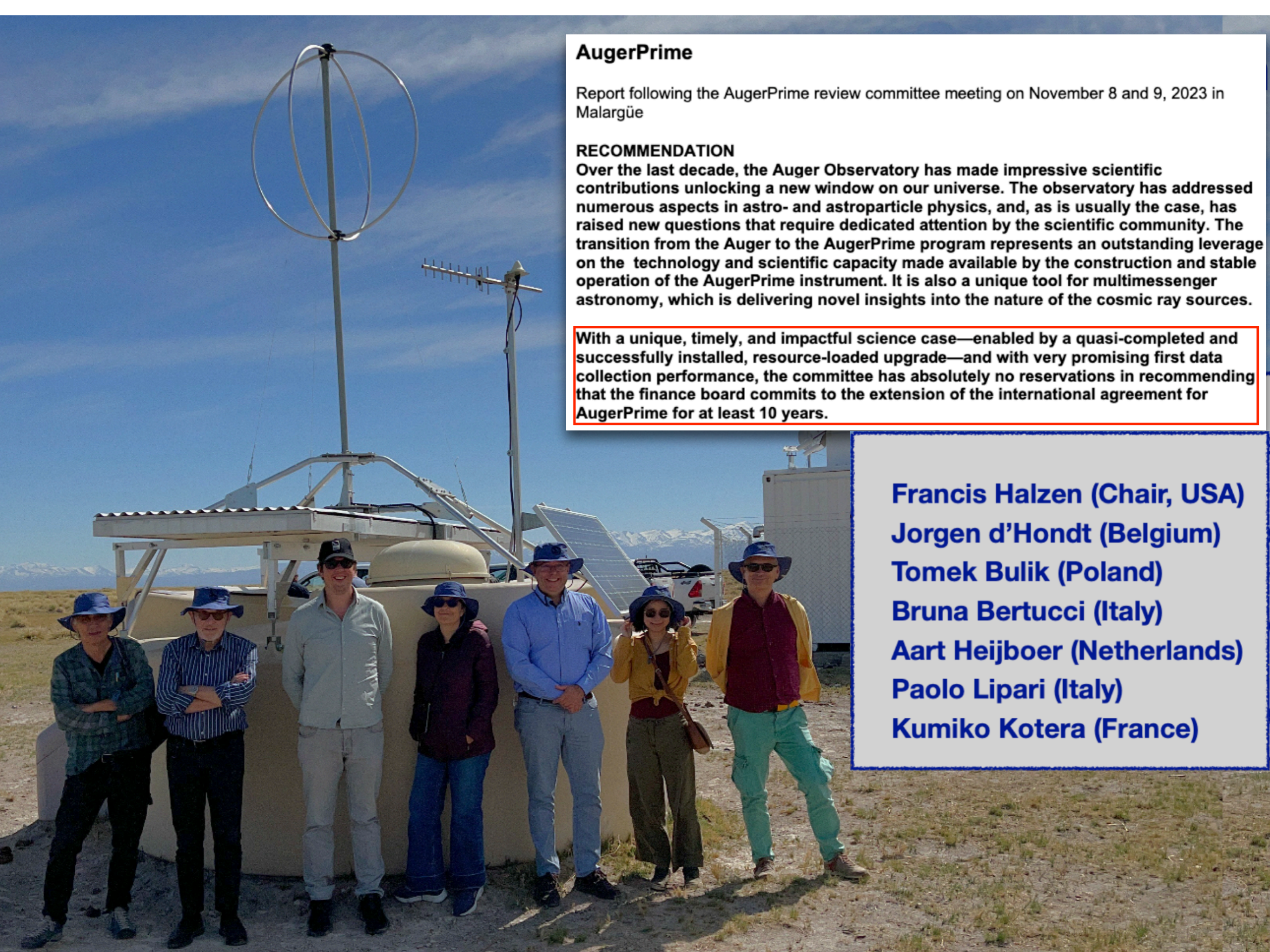
Report following the AugerPrime review committee meeting on November 8 and 9, 2023 in Malargüe

RECOMMENDATION

Over the last decade, the Auger Observatory has made impressive scientific contributions unlocking a new window on our universe. The observatory has addressed numerous aspects in astro- and astroparticle physics, and, as is usually the case, has raised new questions that require dedicated attention by the scientific community. The transition from the Auger to the AugerPrime program represents an outstanding leverage on the technology and scientific capacity made available by the construction and stable operation of the AugerPrime instrument. It is also a unique tool for multimessenger astronomy, which is delivering novel insights into the nature of the cosmic ray sources.

With a unique, timely, and impactful science case—enabled by a quasi-completed and successfully installed, resource-loaded upgrade—and with very promising first data collection performance, the committee has absolutely no reservations in recommending that the finance board commits to the extension of the international agreement for AugerPrime for at least 10 years.

Francis Halzen (Chair, USA)
Jorgen d'Hondt (Belgium)
Tomek Bulik (Poland)
Bruna Bertucci (Italy)
Aart Heijboer (Netherlands)
Paolo Lipari (Italy)
Kumiko Kotera (France)



Annex

to the

Pierre Auger Observatory

International Agreement
for the
Organization, Management and Funding
for the
Operation
of the
Pierre Auger Observatory

Among the
Science Funding Institutions of
Countries in the

Pierre Auger Collaboration

Richiesta: estensione dell'International Agreement per prolungare la presa dati di 10 anni

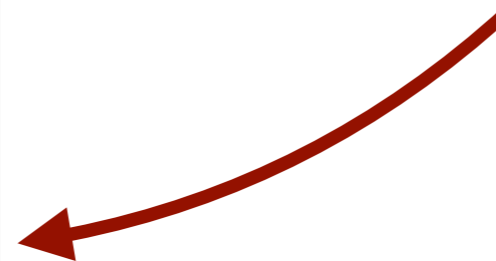
Meeting del Finance Board in Aprile e Giugno

—> decisione finale positiva

Siamo in attesa della comunicazione ufficiale

Prossimi passi:

- Annex all'International Agreement alle Agenzie
- Lettere di invito



14.1 Effective Term

The Agreement shall become effective after the signature by all the Parties.

This Agreement shall expire on December 31st, 2035, unless previously terminated or extended by all Parties.”

3) As for the rest, the Agreement shall be unaffected.

4) This Annex shall come into force on January 1st, 2026 between all Parties that have signed it.

Date importanti per Novembre

- Auger Collaboration Meeting in Malargüe :
November 10 (Sunday) to 15 (Friday)
- Finance Board Meeting : from Friday 15 afternoon
to Saturday 16 morning
- Cerimony - signing the extension of Auger data
taking time: Saturday 16, evening and Visit to
Observatory for VIPs: Sunday 17

<https://indico.nucleares.unam.mx/event/2235/>

- UHECR Symposium:
 - Can include the visit to Observatory on Sunday 17
 - Reception Sunday 16
 - Regular meeting 17-21 November

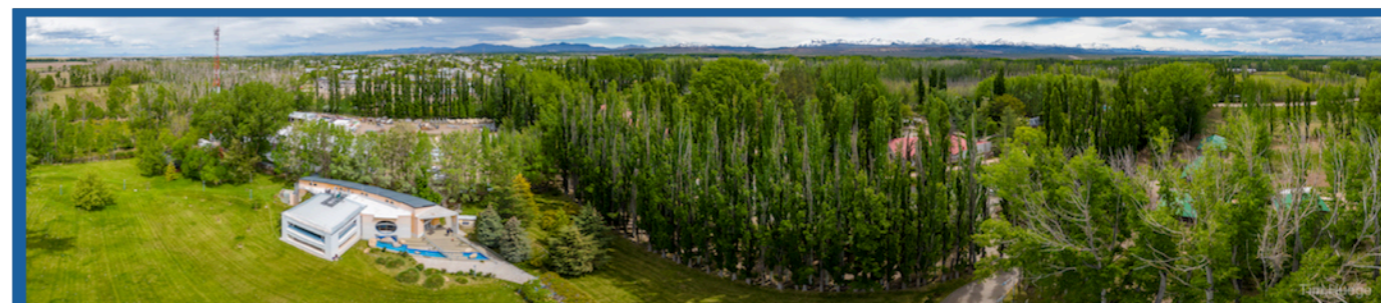
<https://indico.ahuekna.org.ar/event/768/>

Collaboration Meeting November 2024

10-15 November 2024
Centro de Convenciones
Mexico/General timezone

Extension of the Auger International Agreement

16-17 November 2024
Piere Auger Observatory
Mexico/General timezone



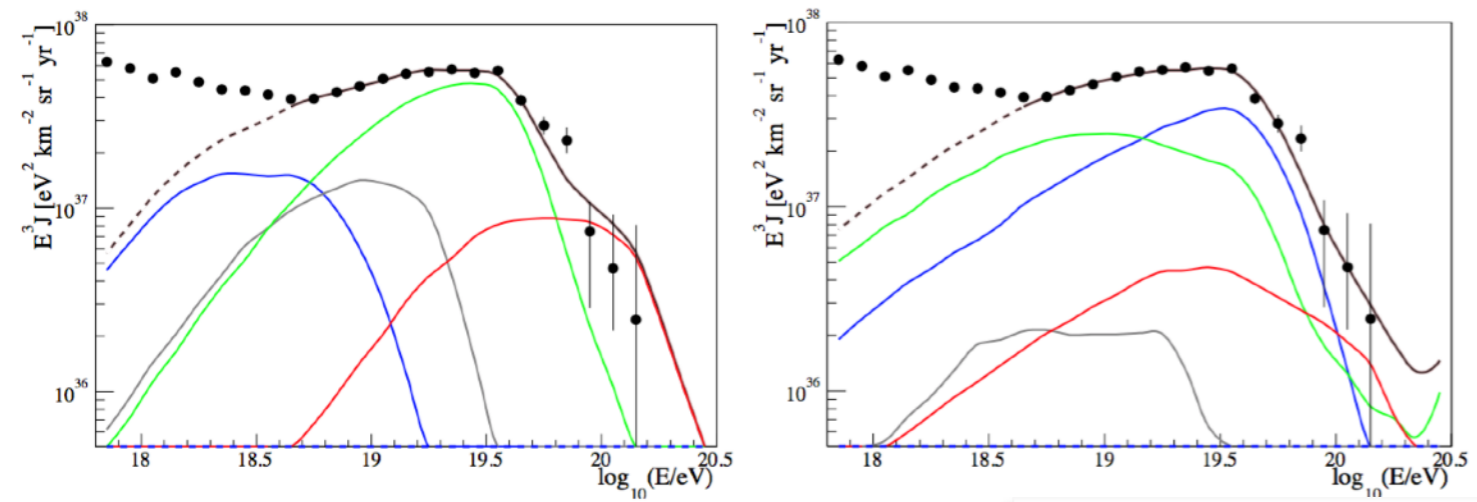
7th International Symposium on Ultra High Energy Cosmic Rays (UHECR) 2024

17-21 Nov 2024
Thesaurus Convention and Exhibition Centre
America/Argentina/Buenos_Aires timezone

Enter your search term

Backup slides

Discrimination of astrophysical scenarios with AugerPrime

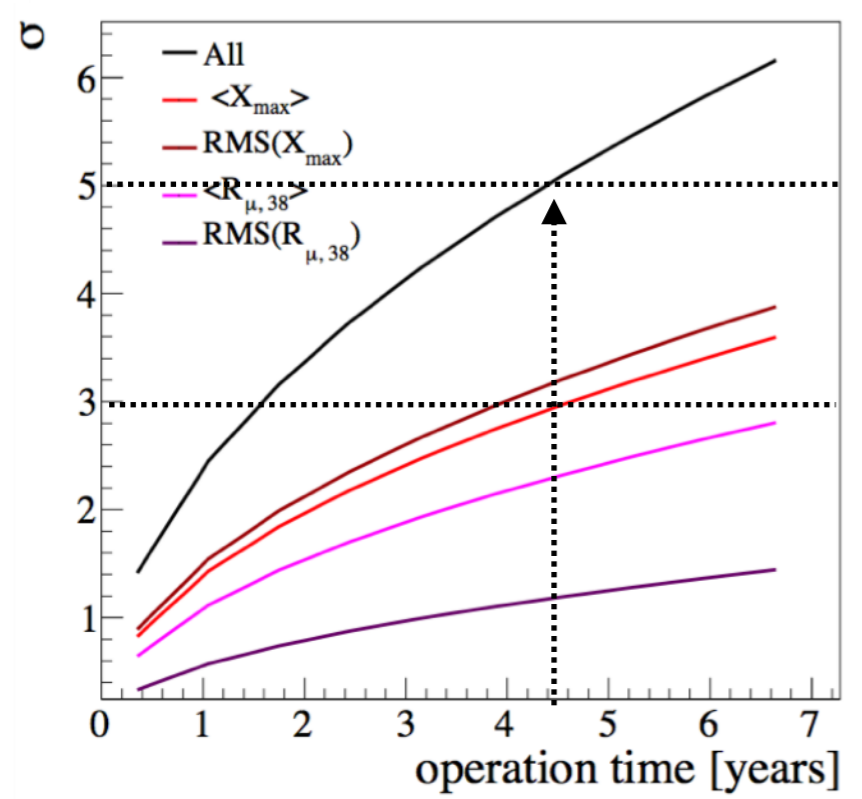


Considering two different benchmark scenarios

- 1- maximum rigidity model
- 2- photodisintegration model

we can

For a given scenario (here n.1), foresee the possibility to tag a fraction as small as 10% of protons at the highest energies with significance σ



evaluate the discrimination power for the two scenarios with the measure of X_{max} , or of muons

