

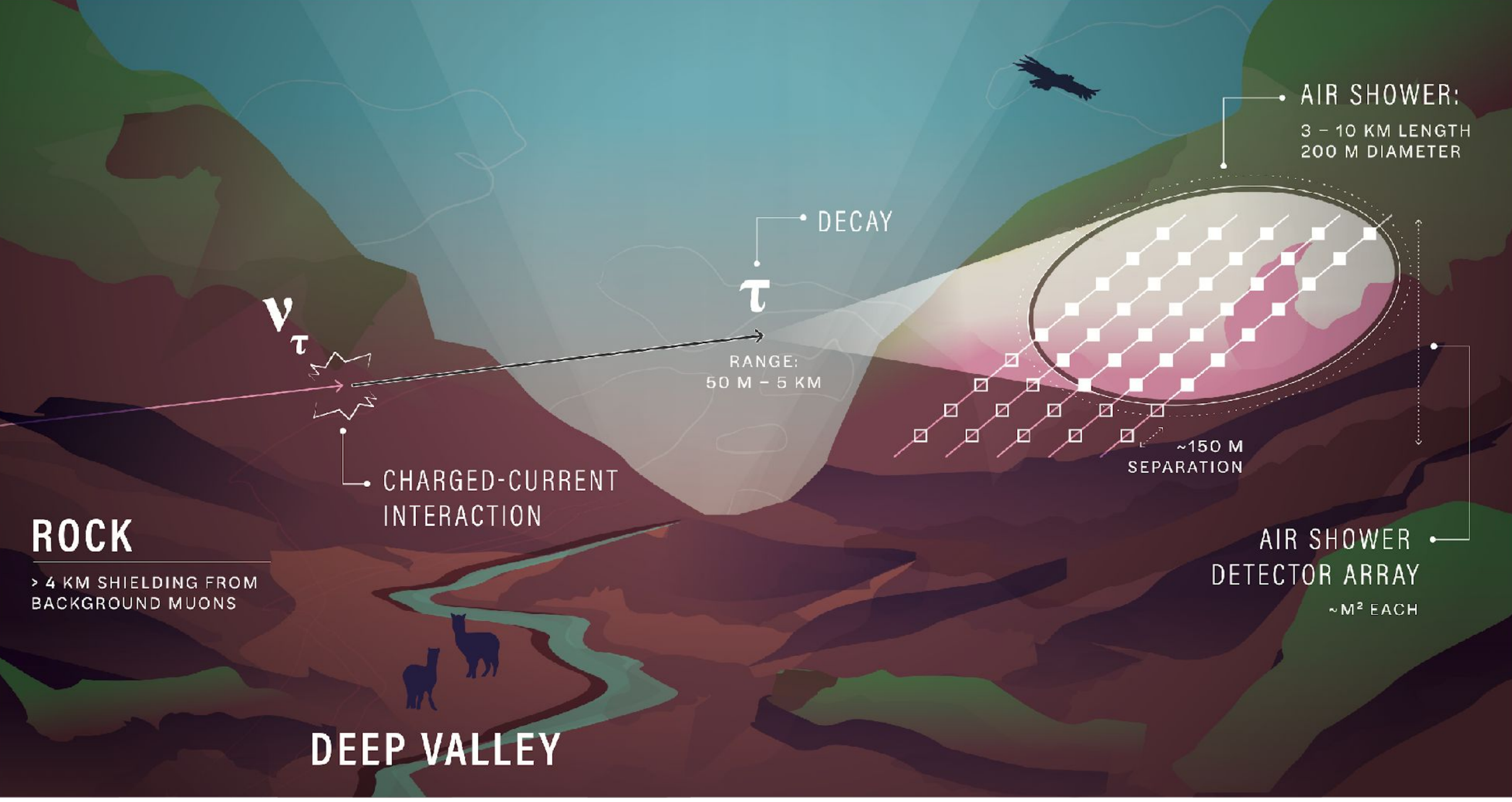
TAMBO: Latest Status and Future Prospects

J. Bazo for the TAMBO Collab.

Pontificia Universidad Católica del Perú

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28/10/2026



TAU AIR-SHOWER MOUNTAIN-BASED OBSERVATORY (TAMBO)

THE TAMBO COLLABORATION

UNITED KINGDOM
University of Cambridge

DENMARK
Niels Bohr Institute (NBI)

GERMANY
Universität Hamburg (UHH) *

SWITZERLAND
University of Bern *

BULGARIA
Sofia University *

CANADA
Queen's University
Simon Fraser University (SFU) *
Western University *

SPAIN
Instituto de Física Corpuscular (IFIC)
Universidad de Oviedo
Universidade de Santiago de Compostela

ITALY
INFN Sezione di Padova

INDIA
Birla Institute of Technology and Science *

TAIWAN
Academia Sinica

UNITED STATES
Harvard University
Los Alamos National Laboratory (LANL)
Ohio State University (OSU)
Swarthmore College
University of Hawai'i at Mānoa (UHM)
University of Nevada, Las Vegas (UNLV)
University of Utah
Massachusetts Institute of Technology (MIT) *
University of Delaware *
University of Michigan *
University of Wisconsin-Madison *

PERU
Comisión Nacional de Investigación y Desarrollo Aeroespacial (CONIDA)
Instituto Geofísico del Perú (IGP)
Pontificia Universidad Católica del Perú (PUCP)
Universidad Católica San Pablo
Universidad Continental
Universidad Nacional Mayor de San Marcos (UNMSM)
Universidad Nacional San Antonio de Abad (UNSAAC)
Universidad Nacional de Ingeniería
Universidad Nacional de San Agustín (UNSA)
Universidad de Ingeniería y Tecnología (UTEC)
Universidad del Pacífico

MEXICO
Universidad Nacional Autónoma de México (UNAM)

EL SALVADOR
Universidad de El Salvador (UES)

GUATEMALA
Universidad de San Carlos de Guatemala (USAC)



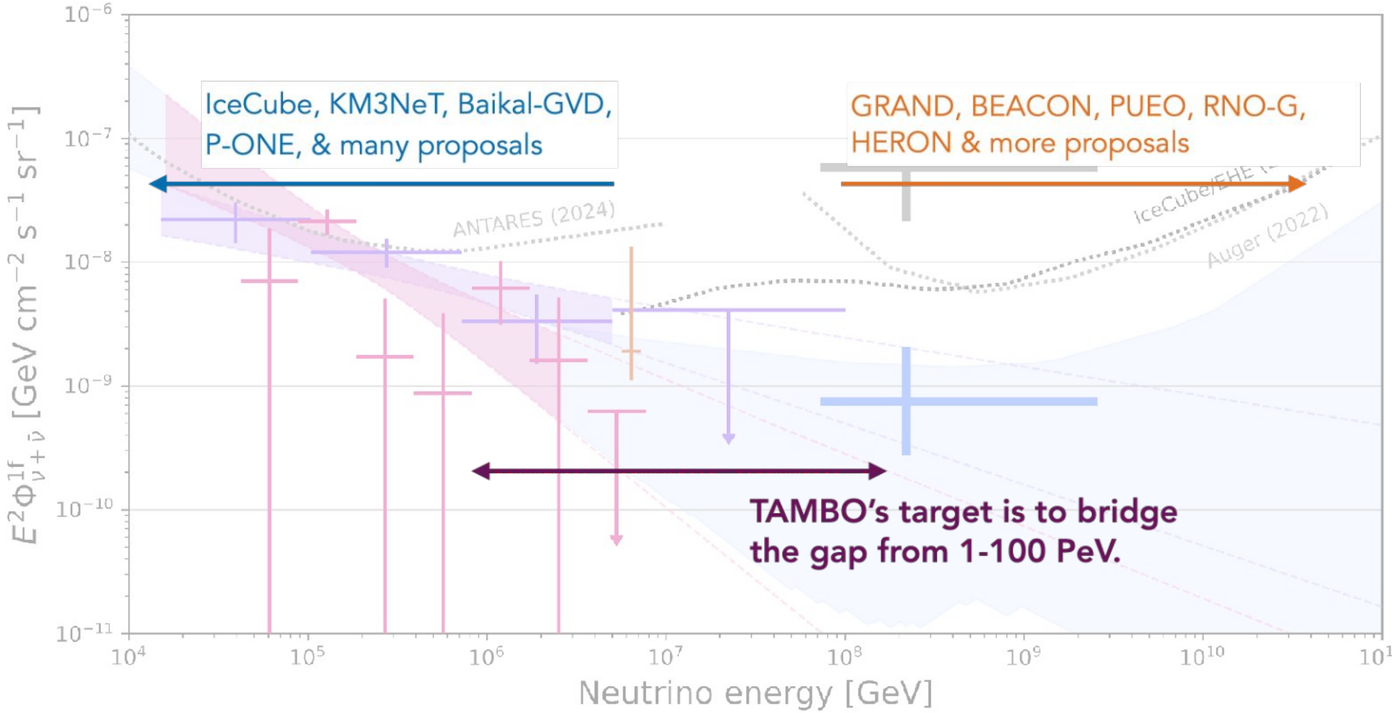
https://www.tambo-observatory.com/

FUNDING

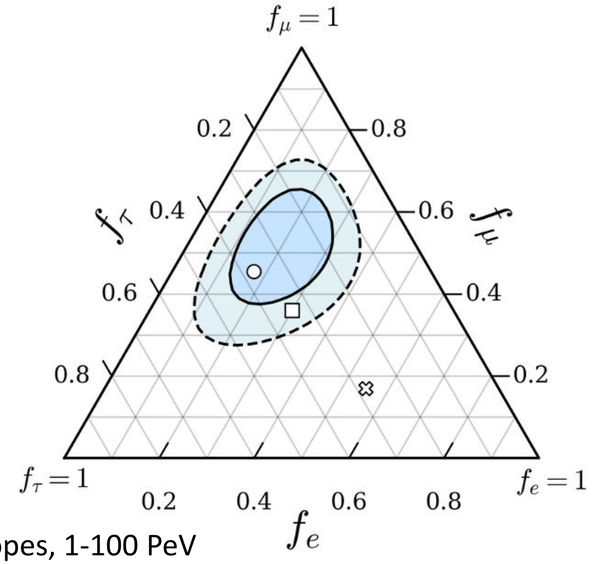
John Templeton Foundation · Harvard University · UTEC · PUCP Legacy support: CIFAR

Science with TAMBO

- **Astrophysical neutrino flux**: 1 - 100 PeV.
- **Discover** new sources of astrophysical neutrinos.
- **Neutrino flavor composition** with ultra-long baseline.
- Muon content of **air showers** at different altitudes.

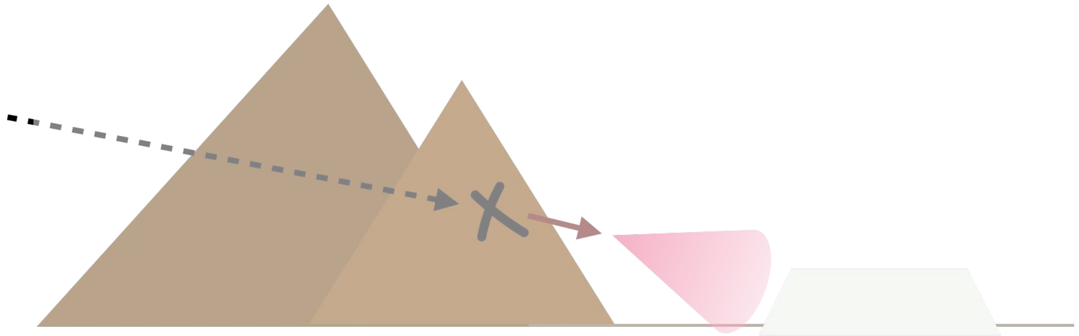


KM3NeT, *Phys. Rev. X* 15, 031016

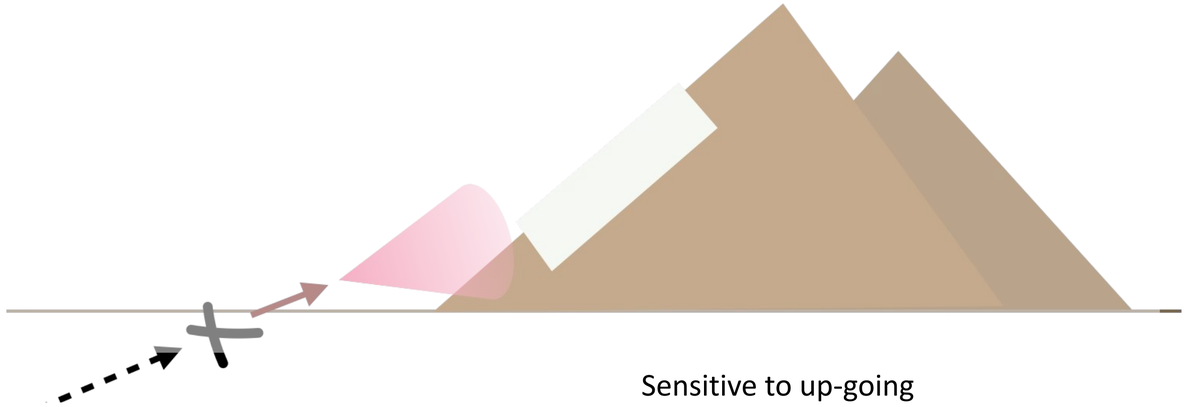


TAMBO & other next-gen telescopes, 1-100 PeV

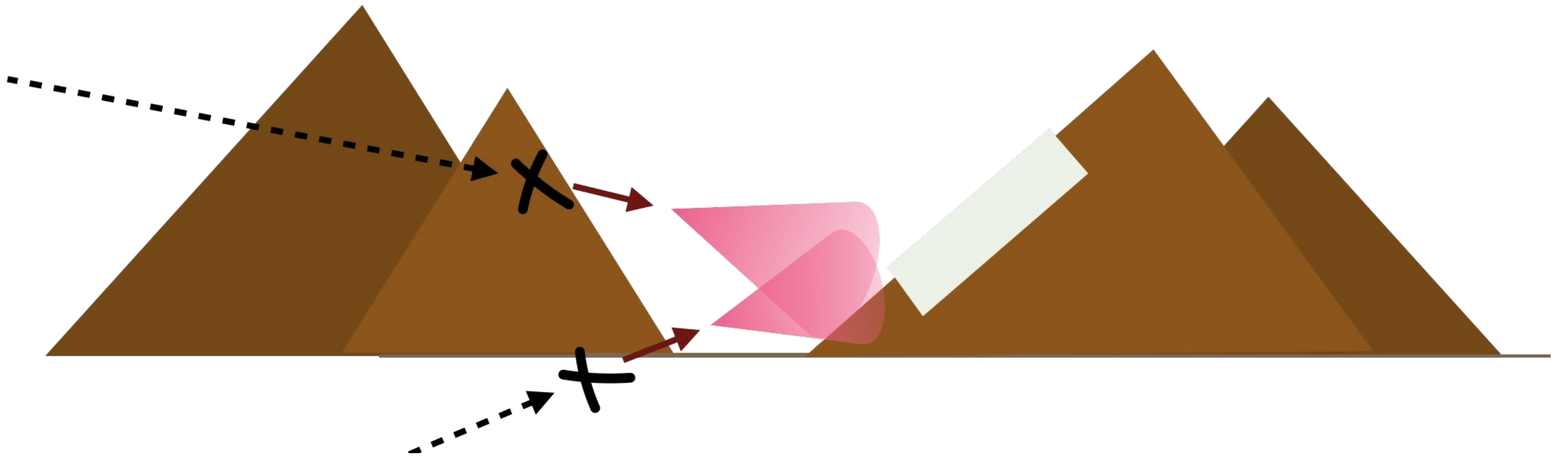
The Geometry



Sensitive to down-going



Sensitive to up-going

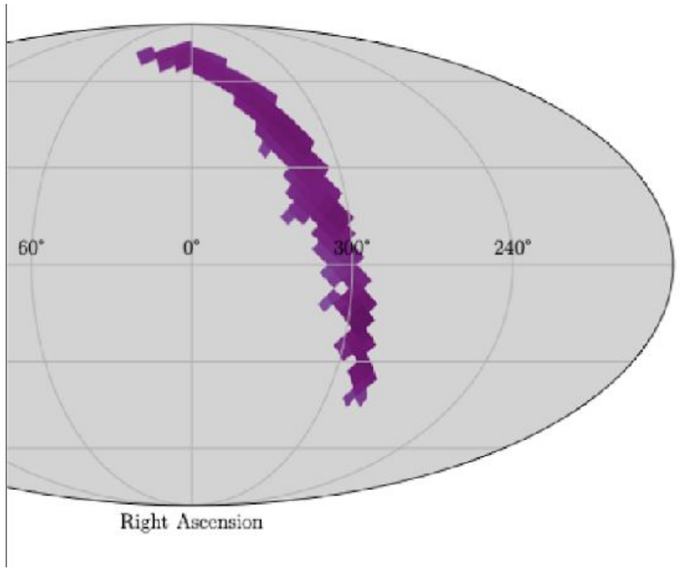


A canyon detector is sensitive to up- and down-going

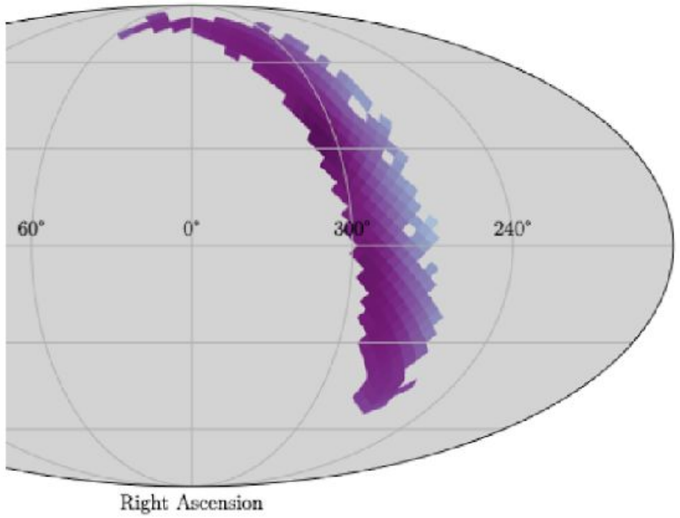
Sky Coverage

Increased by 50%

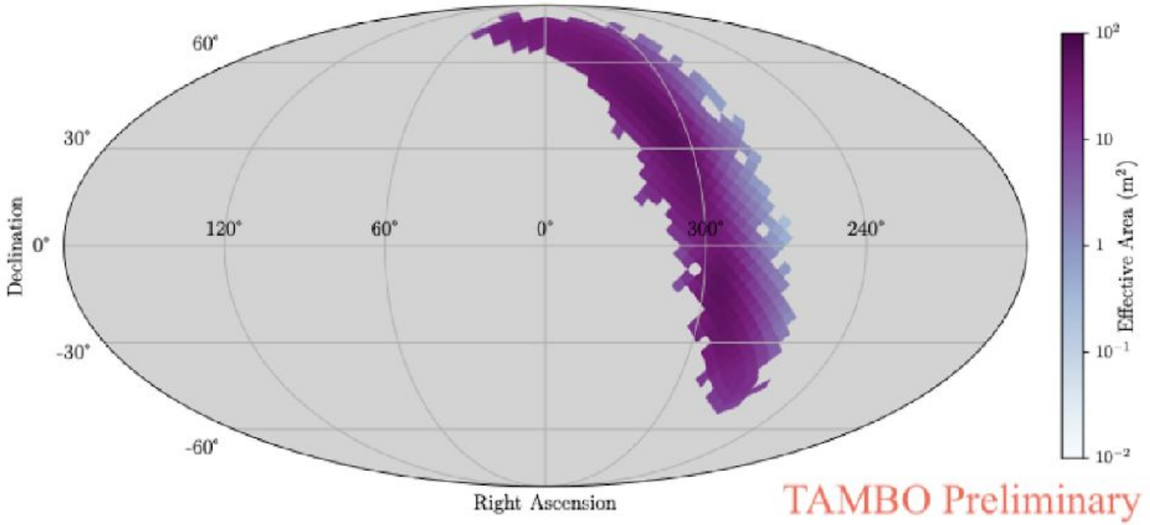
Down-going



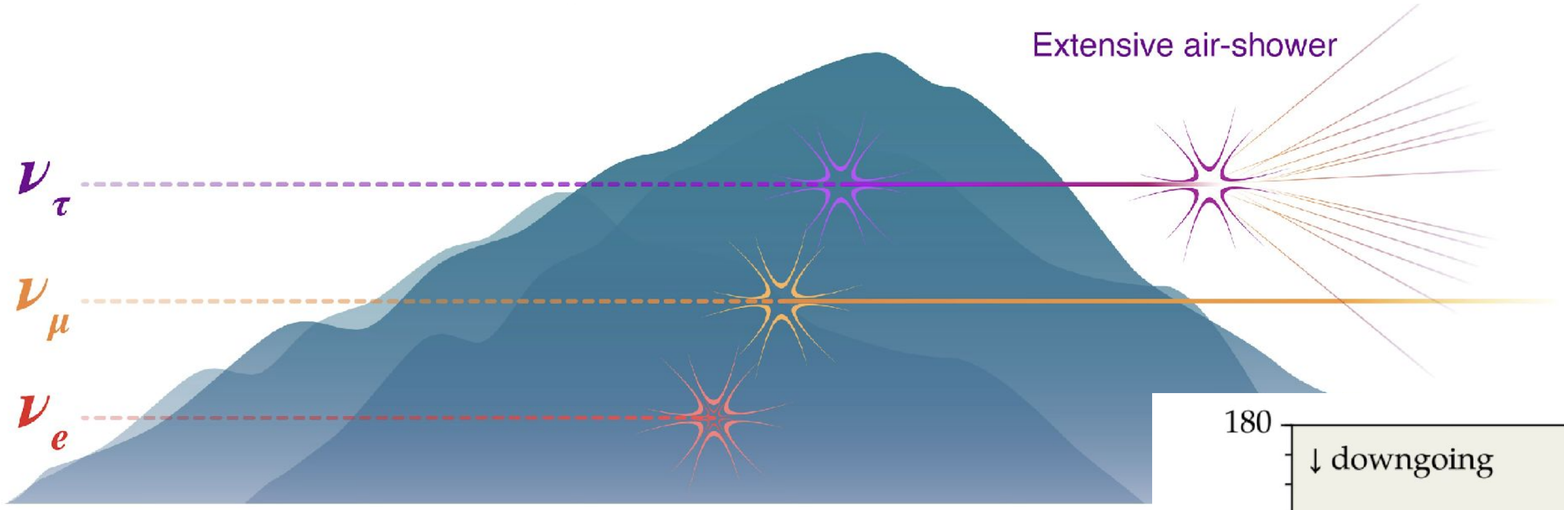
Up-going



Full acceptance

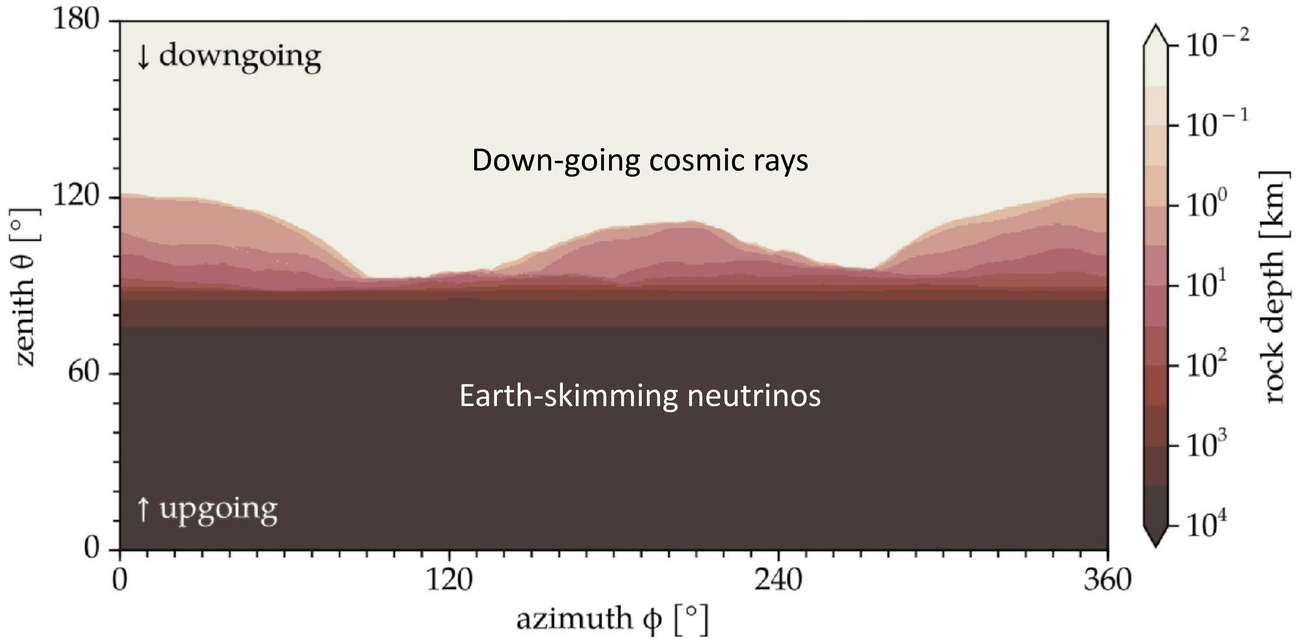


Tau neutrinos & background

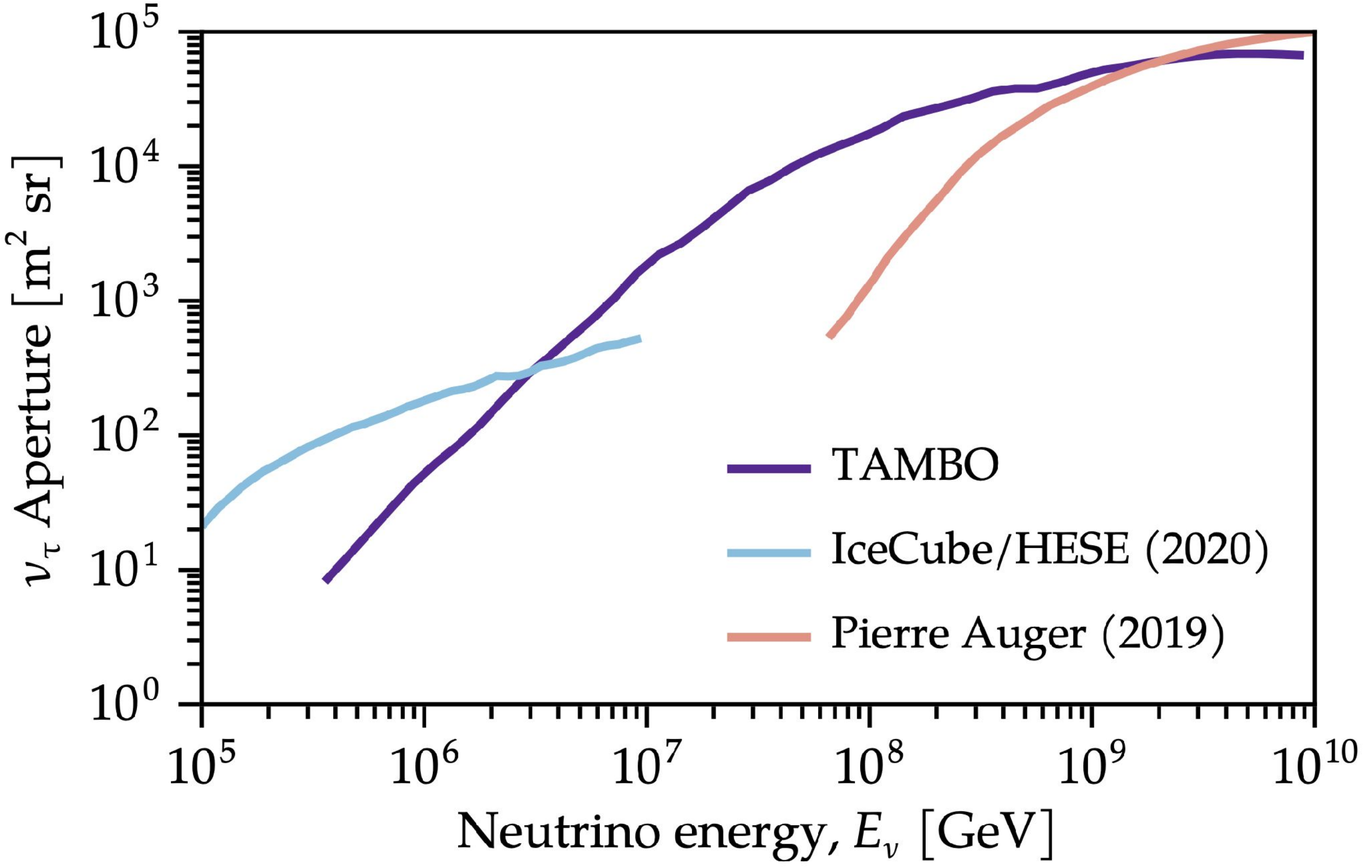


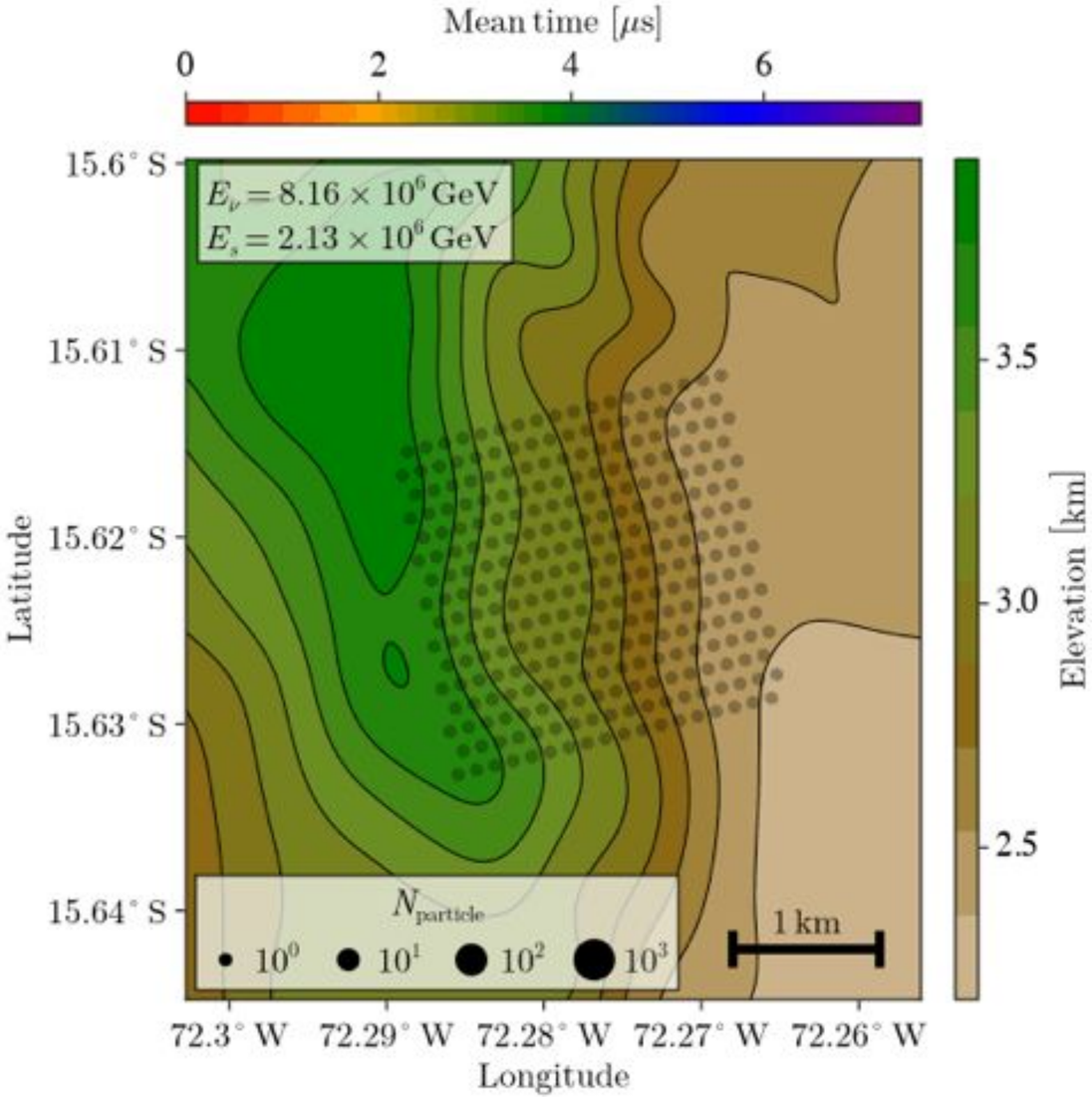
- Electrons shielded by canyon
- Muons are very good at retaining energy
- Only τ efficient at creating shower

Mountain shield

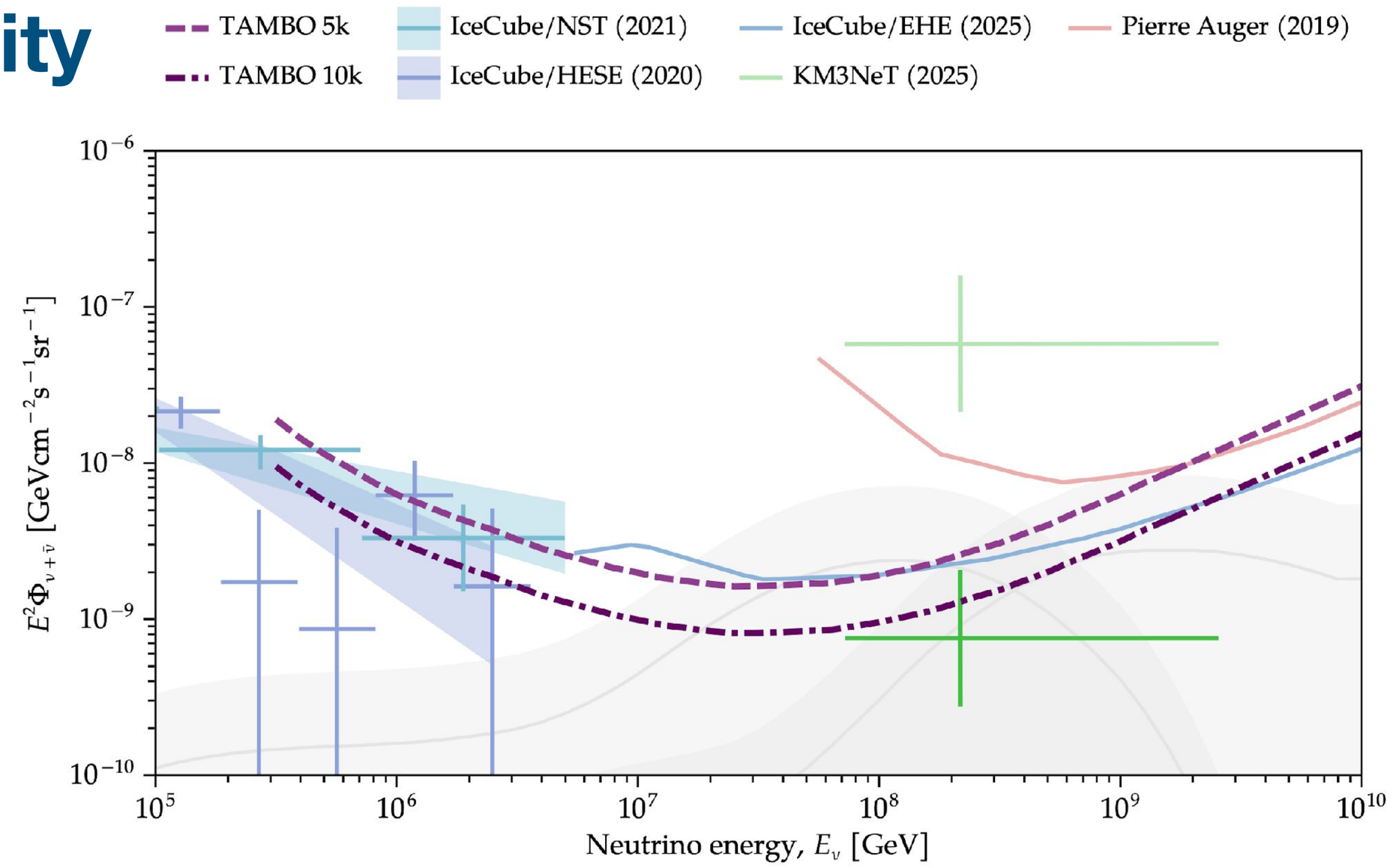


Simulations



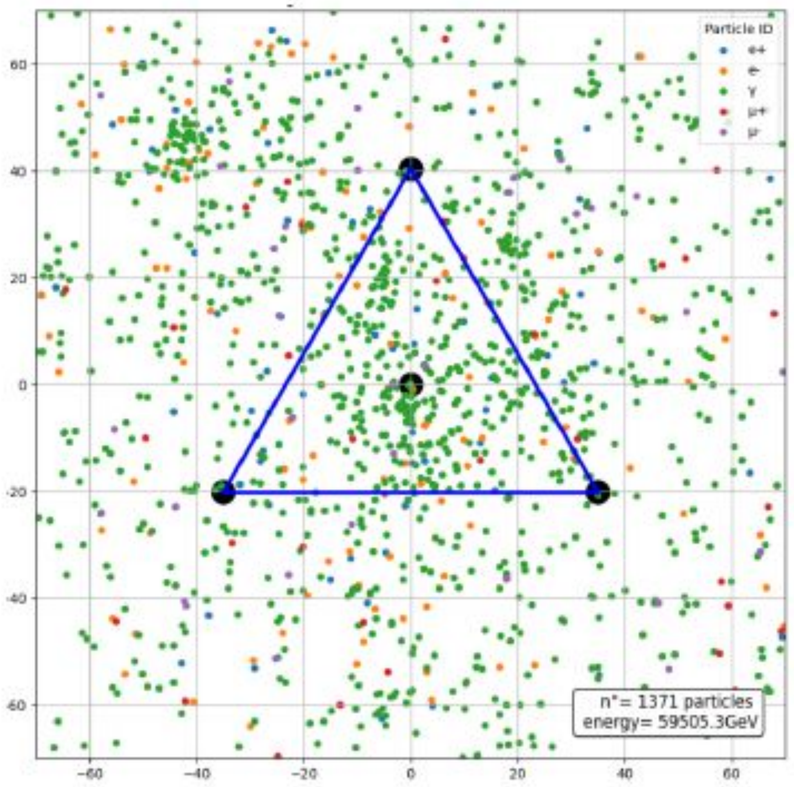


Sensitivity



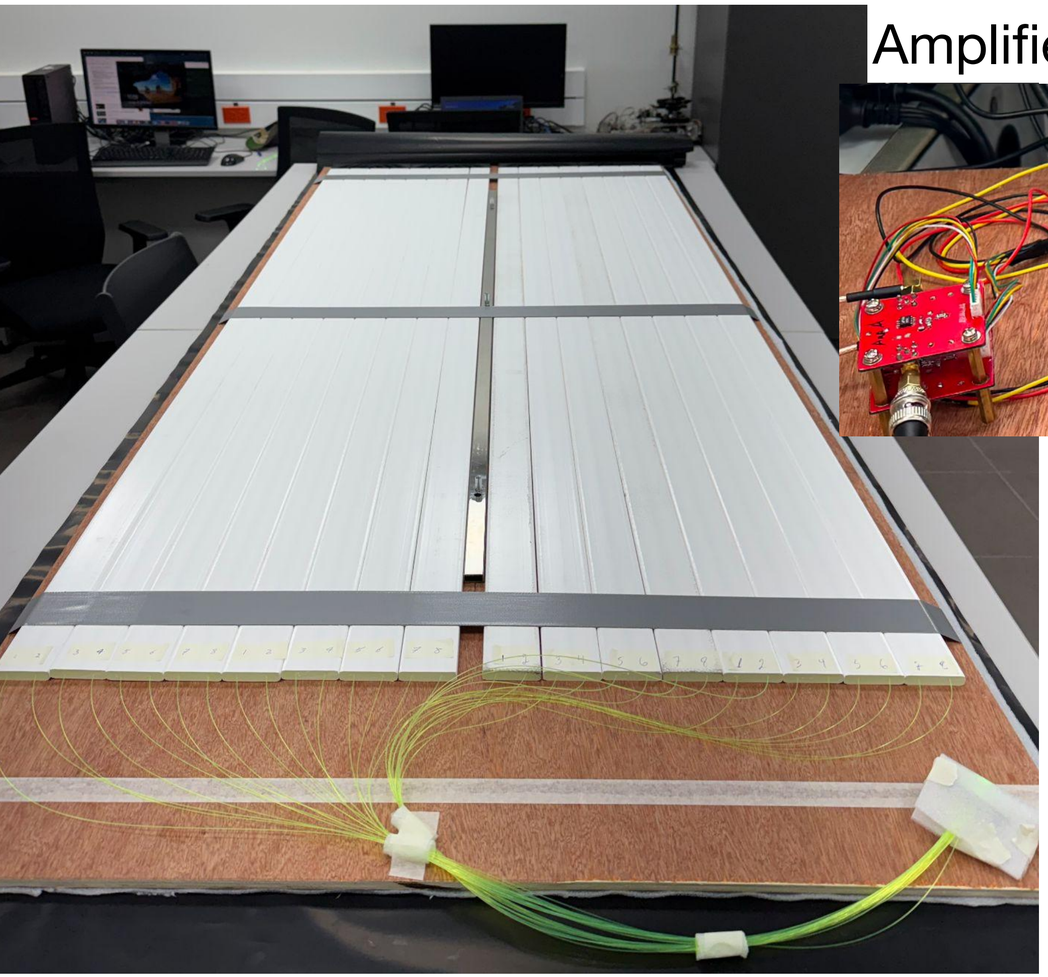
TAMBO-4: *a testbed for TAMBO (latest status)*

- **Detector prototype array** of 4 detector units for TAMBO.
- **Test different technologies** for DAQ and Comms.
- **Test shower reconstruction** performance
- **Measure cosmic rays** at sea level

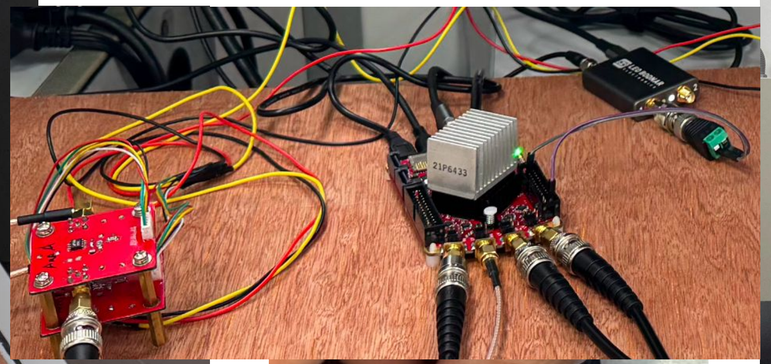


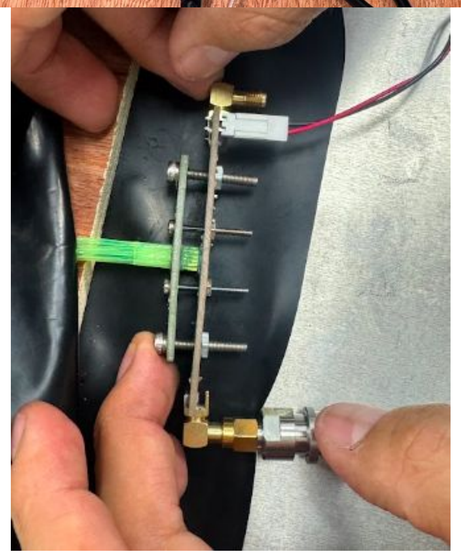
CORSIKA simulation of ~60 TeV proton

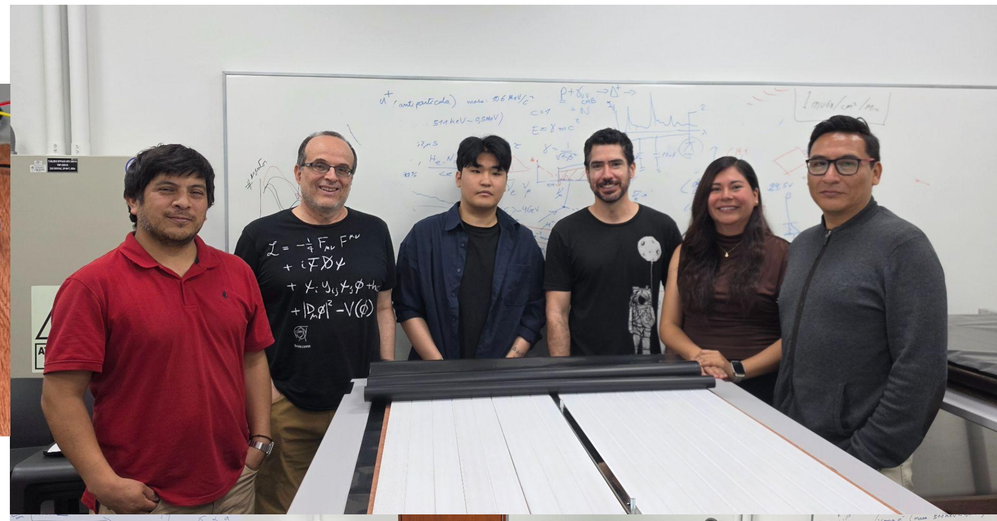
TAMBO-4: *Panel construction at HEP-PUCP Lab*



Amplifier+RedPitaya+GPS



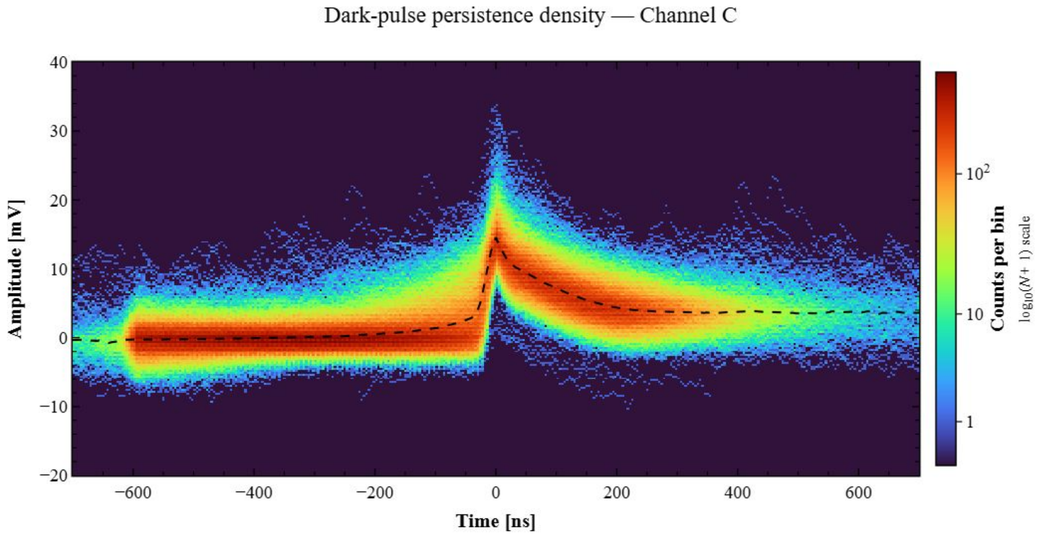


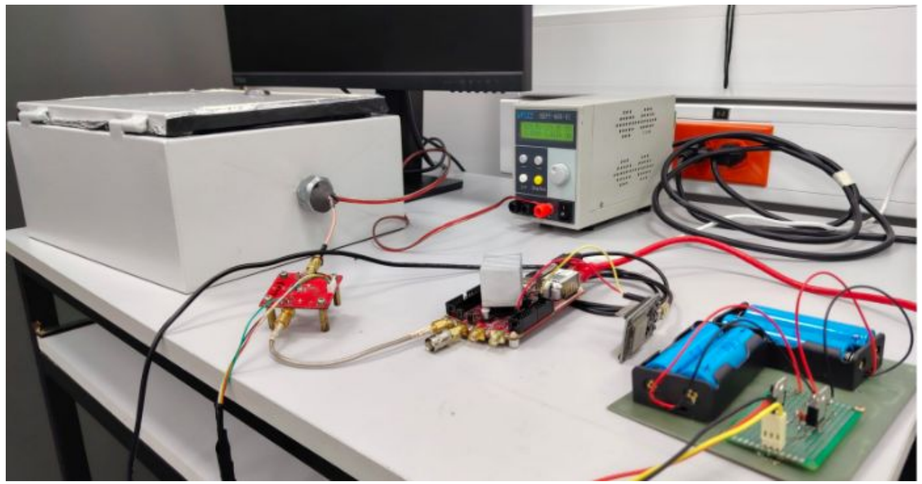


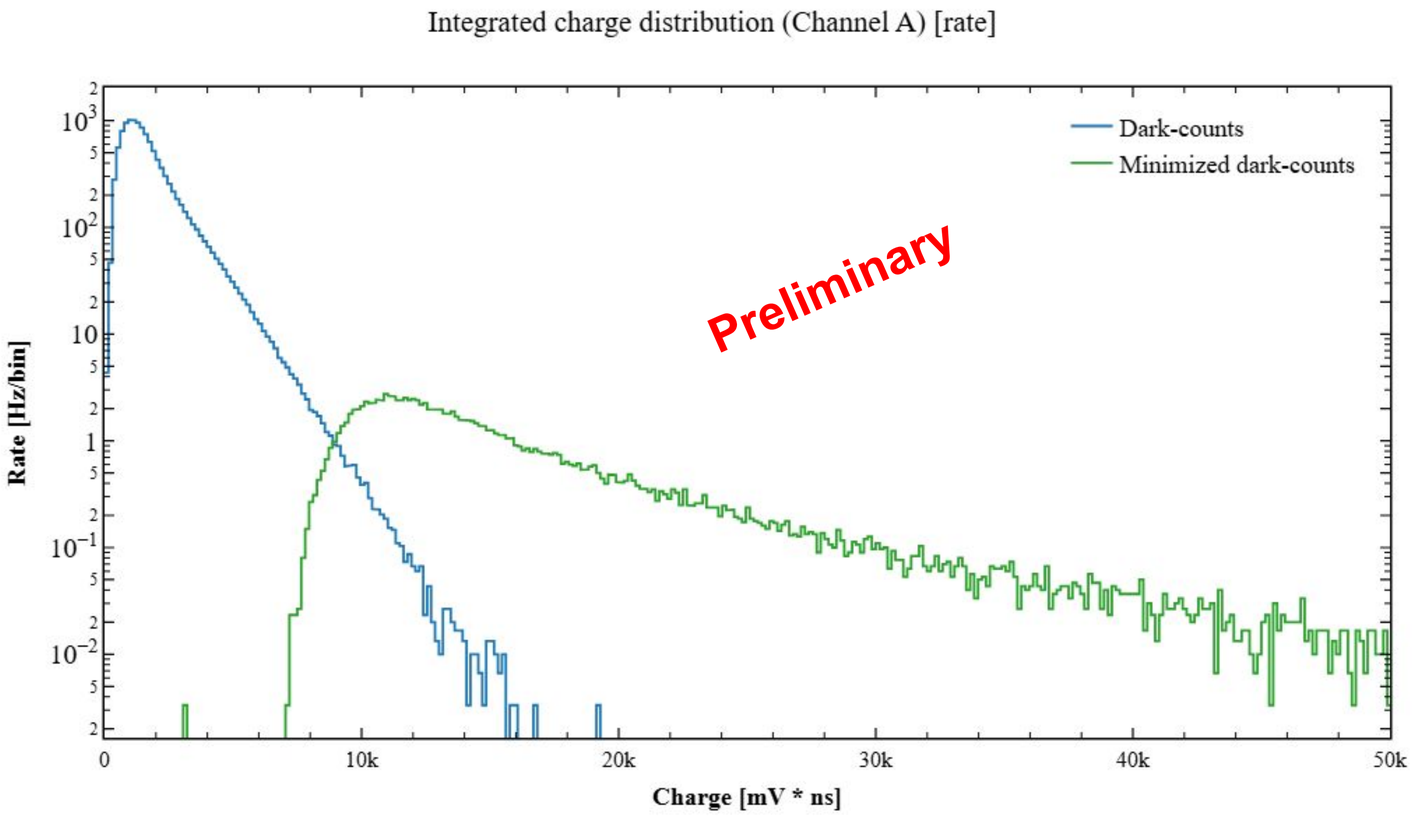


16 Plastic Scintillator bars (185cmx5cm) + WLSFiber+SiPM

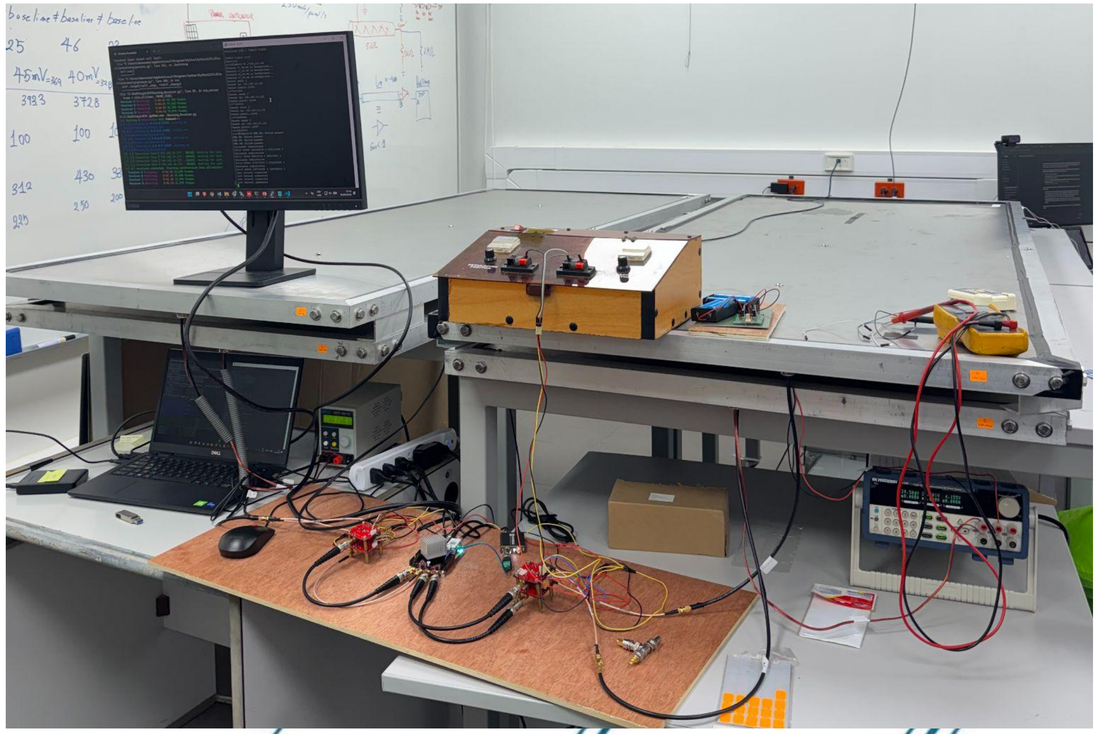
TAMBO-4: *SiPM dark count characterization*

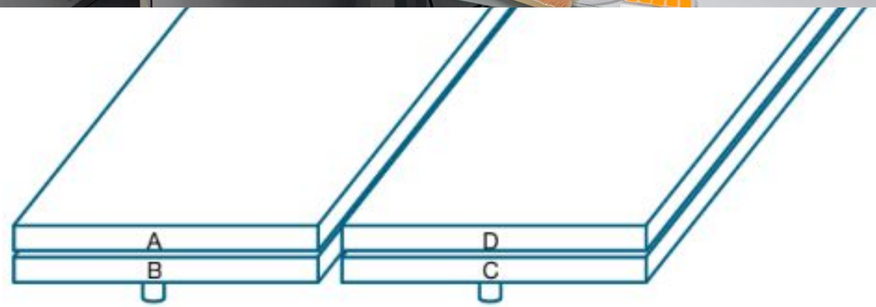


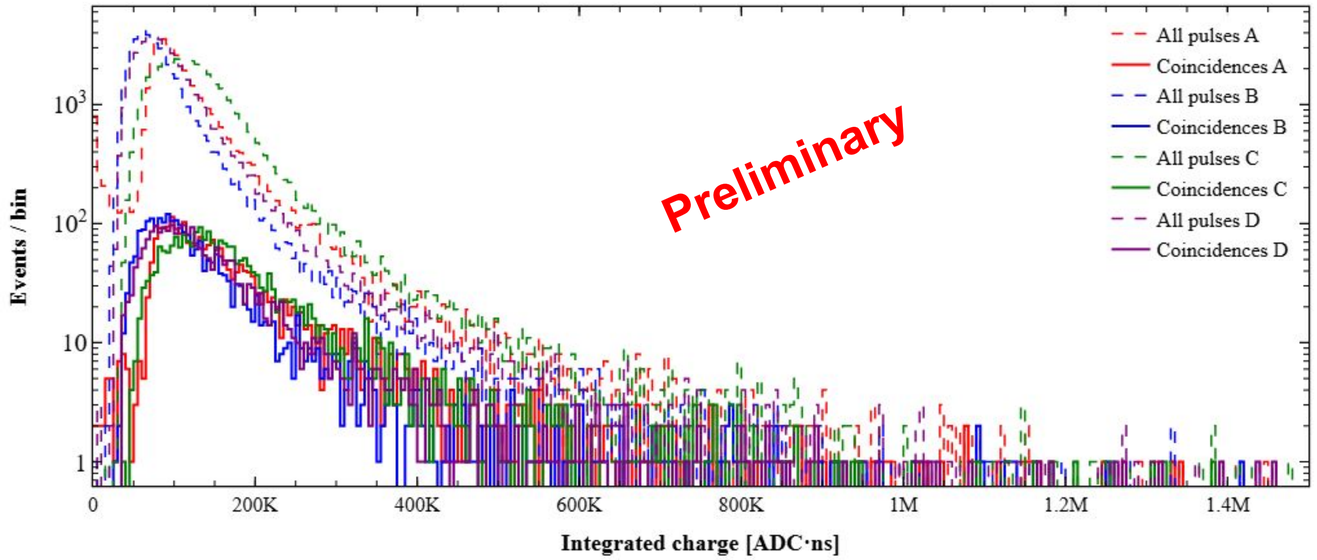


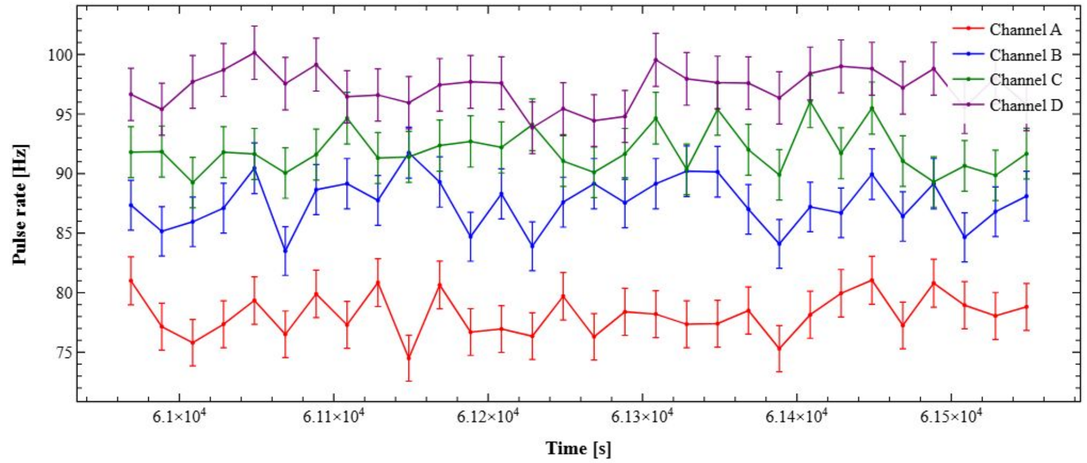


TAMBO-4: *2-panel coincidence measurement*

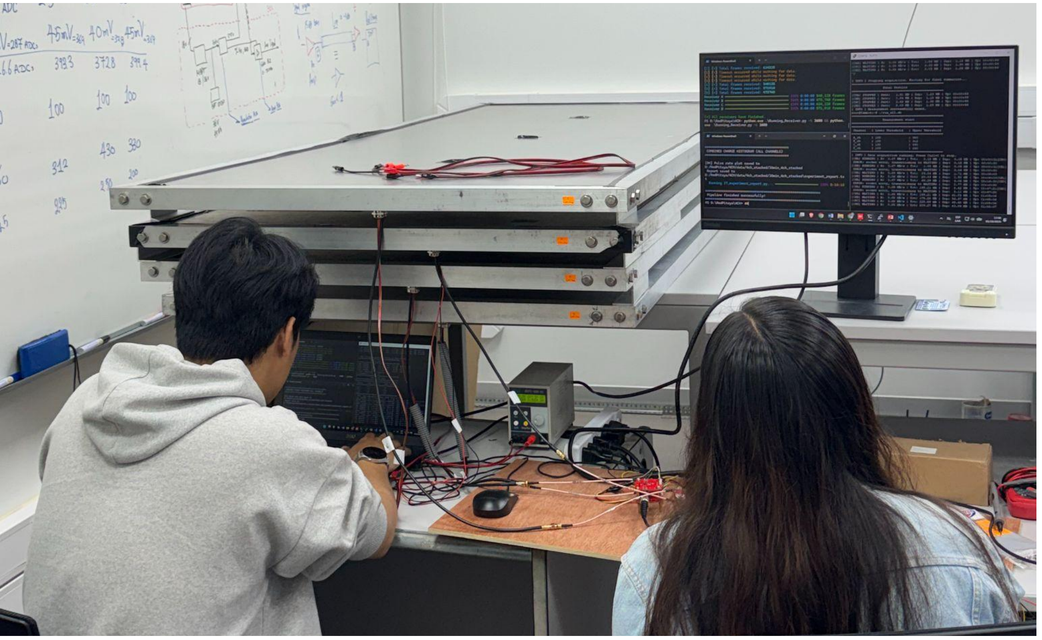


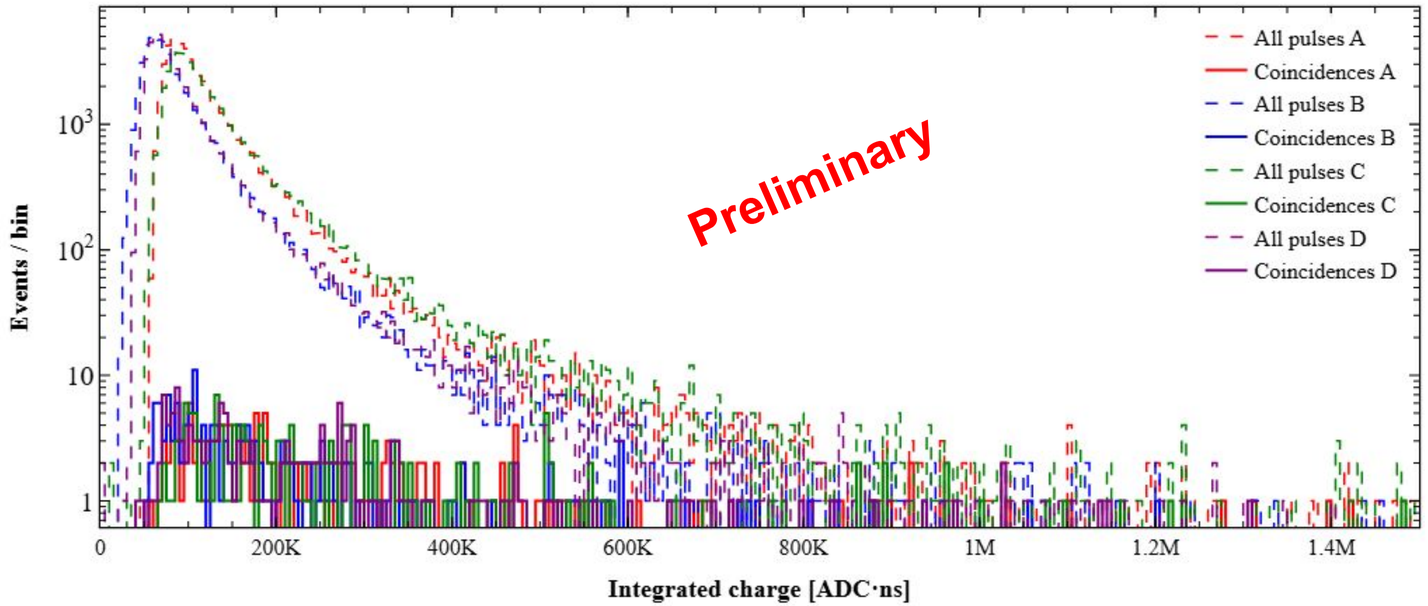


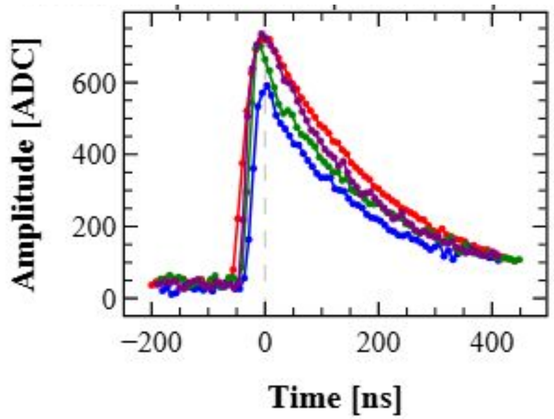


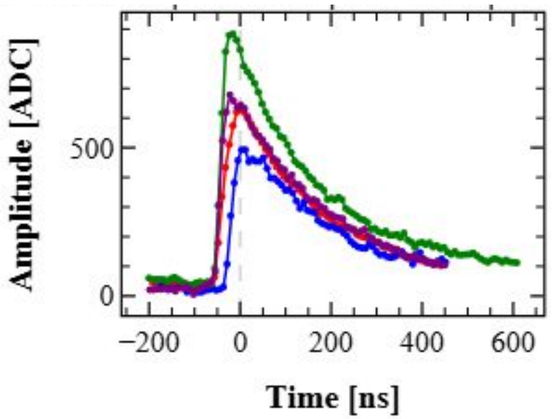


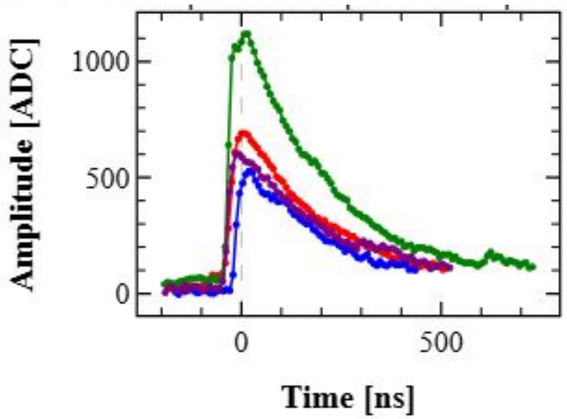
TAMBO-4: *4-panel coincidence measurement*

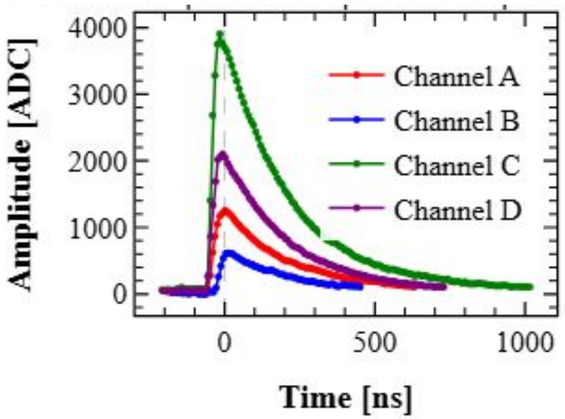








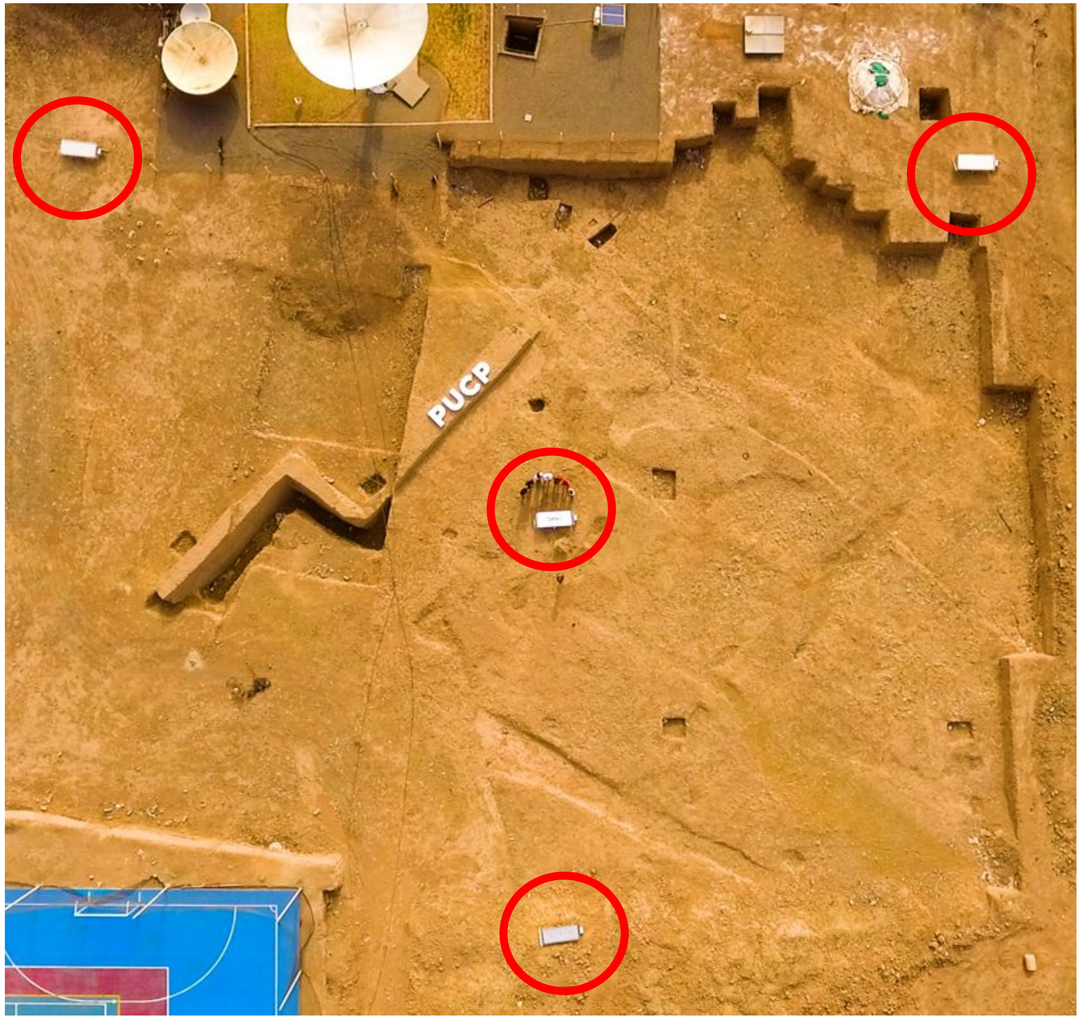




TAMBO-4: *array prototype deployment at PUCP Campus*

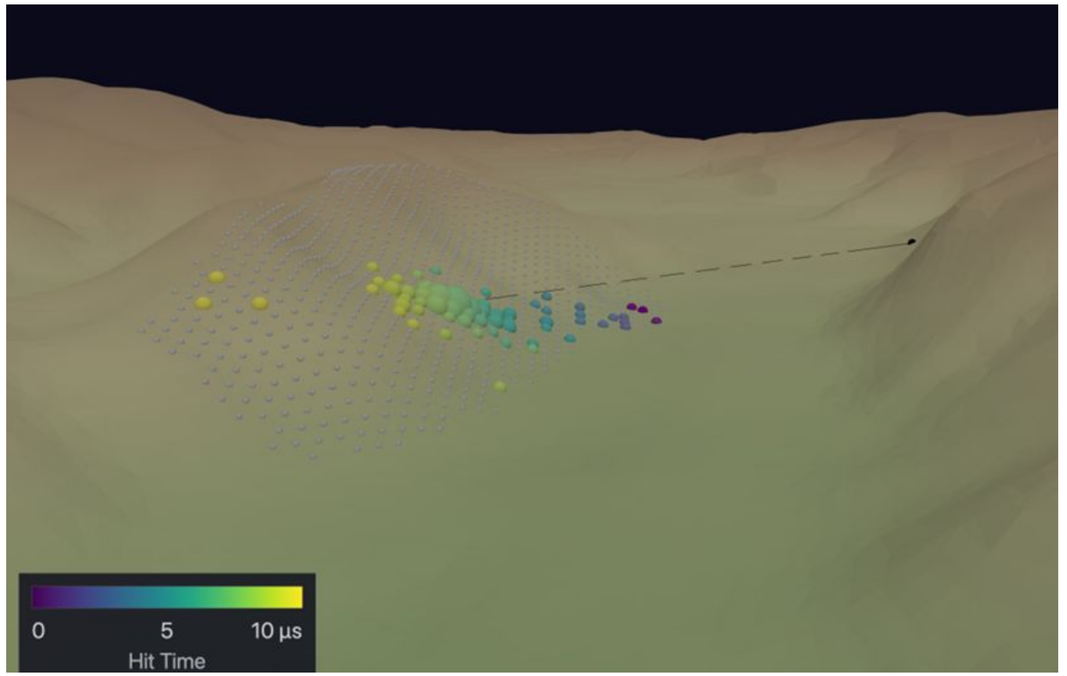


Detector unit



TAMBO: *Future Prospects*

- (short term, funded) **TAMBO-10**: test final design detector unit array at PUCP Campus and later deploy at Arequipa site.
- (medium term, funded) **TAMBO-100**: deployment at Arequipa site for Cosmic rays physics.
- (long term) **TAMBO**: discover astrophysical sources with tau neutrinos.



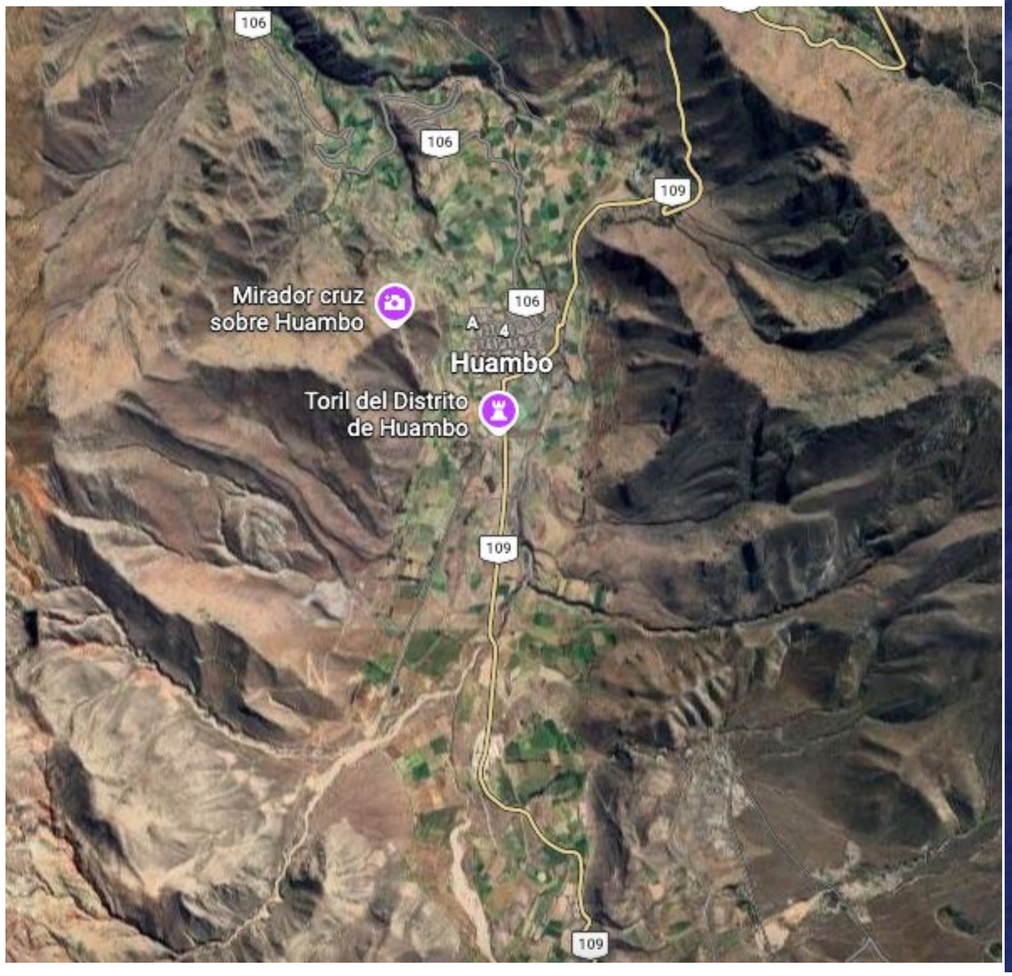
15 PeV τ from 52 PeV ν_τ

TAMBO-100: *deployment in Arequipa-Perú*

Responsible siting

Requirements:

- Fit ~100 panels with ~125m spacing
- Max slope 35°
- Opposite face 3-8 km away





Possible site: Huambo, 3300 m.a.s.l.



Thanks!

TAMBO

https://www.tambo-observatory.com/



New collaborators are welcomed!

TAMBO promotional video