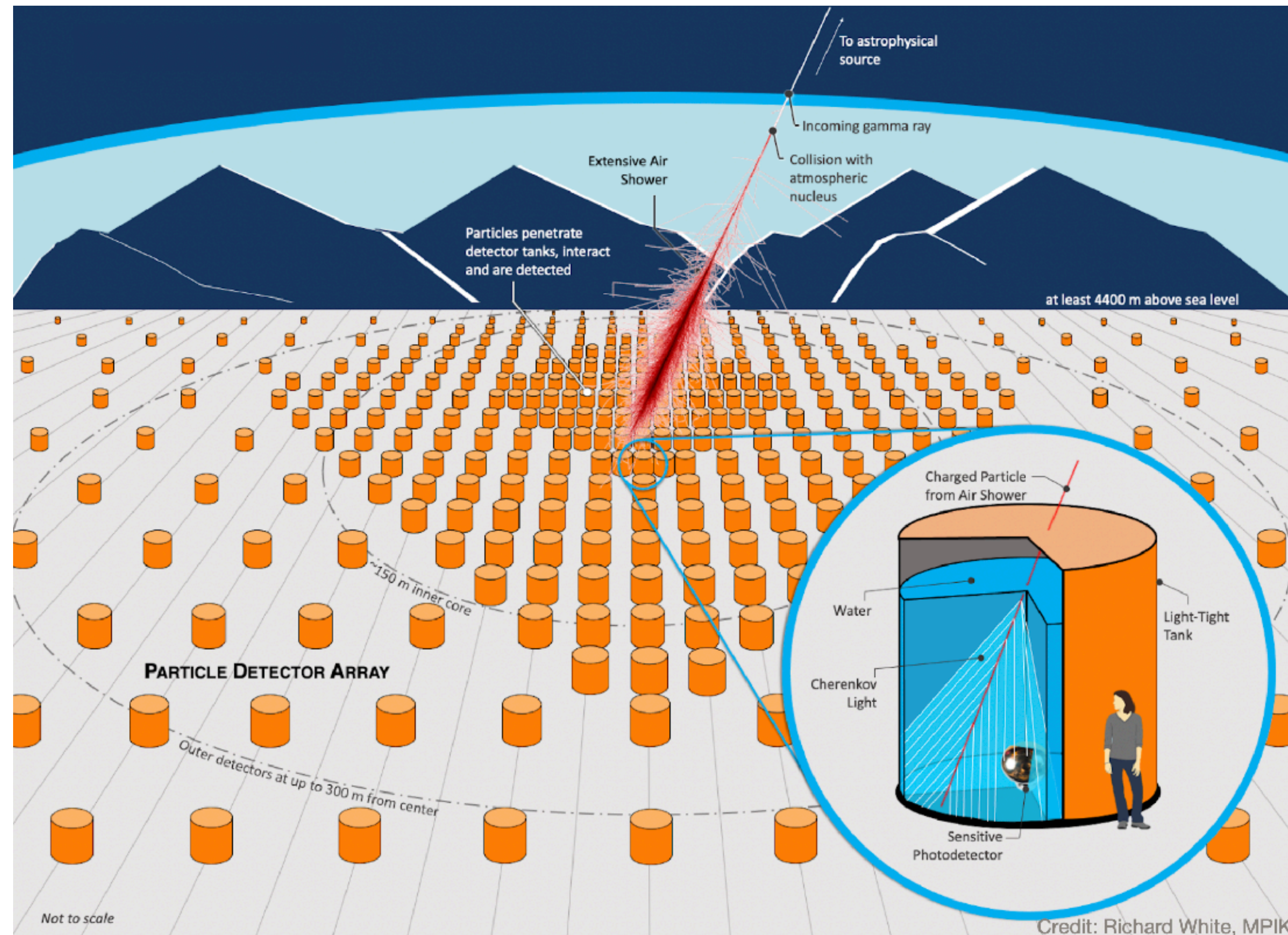


SWGO: Southern Wide-field Gamma-ray Observatory



D. Piccolo
A. Paoloni
S. Meola

SWGGO: Southern Wide-field Gamma-ray Observatory

A gamma-ray observatory based on ground-level particle detection

© SWGGO is currently in the **R&D phase**.

© **100 GeV-1 PeV** energy range @ **4.4 km** or higher (low energies) and extend over a **km²** area (high energies).

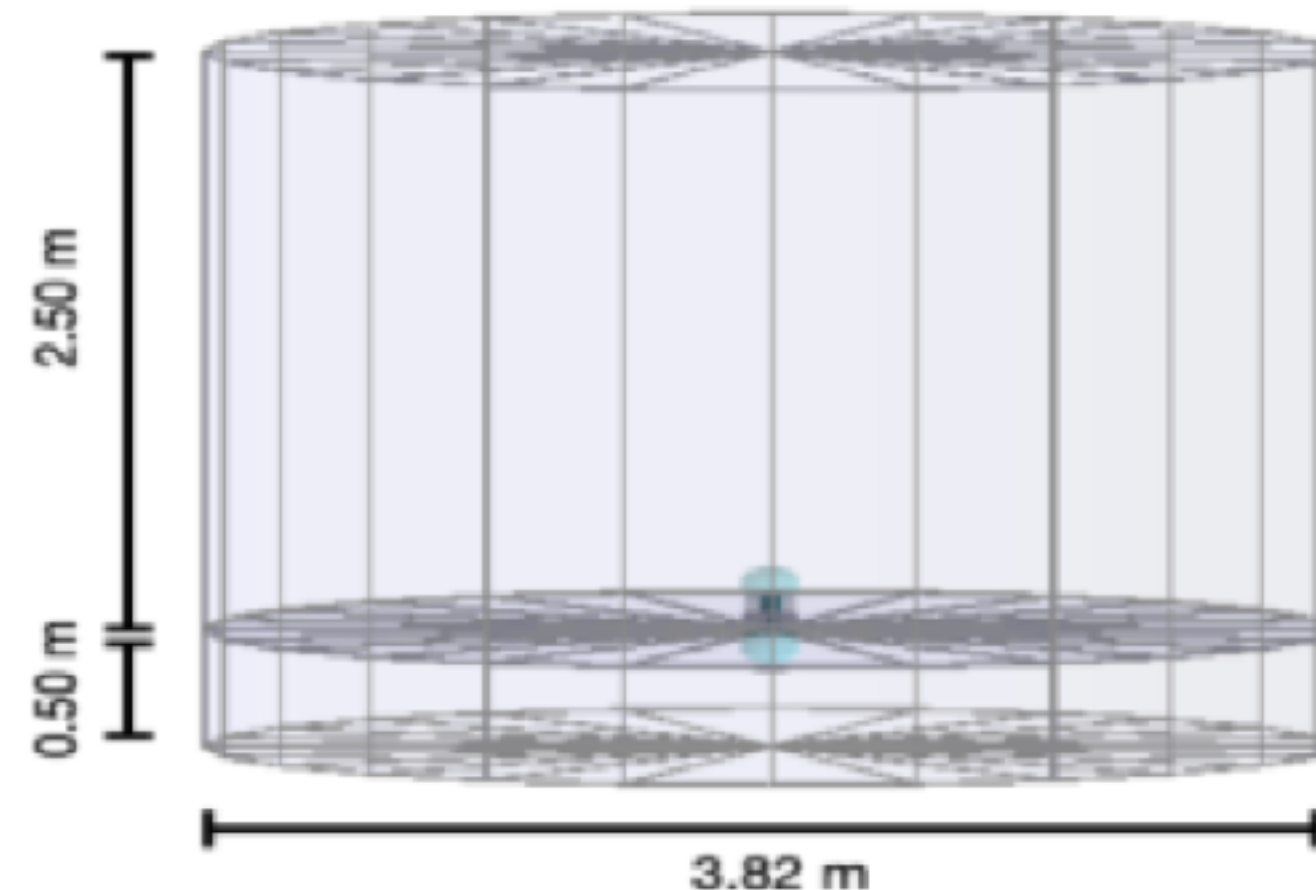
© Located in South America

© Based primarily on **water Cherenkov detector** units.

© Improved angular ($<0.2^\circ$) and energy resolutions ($<30\%$) above 10 TeV .



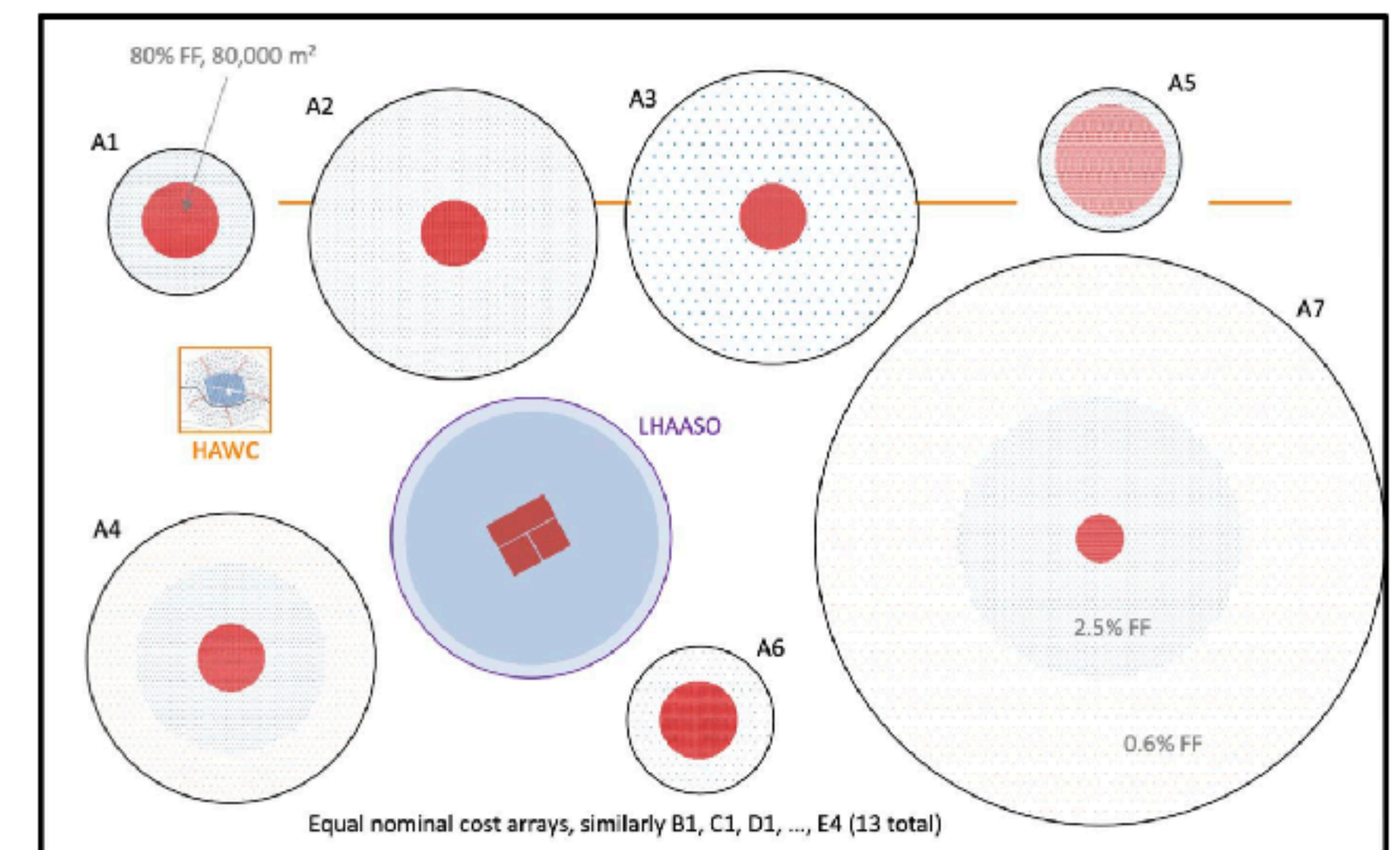
Water Cherenkov tank



★ → IACT Operating ground based experiments
★ → EAS detectors



Different layouts are defined at equal nominal cost.



PNRR CTA+ WP 1520, INAF:

INFN will support the construction and test of an Hybrid **RPC+WCD** of about 100-200 m² (275 k€ for RPC production + DAQ system)

Institutions: **INFN RM2 - INAF + LNF**

Due to the RPC low energy threshold for particle detection, a carpet of RPCs on top of WCD tanks could improve gamma ray detection efficiency down to **100 GeV**. (ARGO experience)

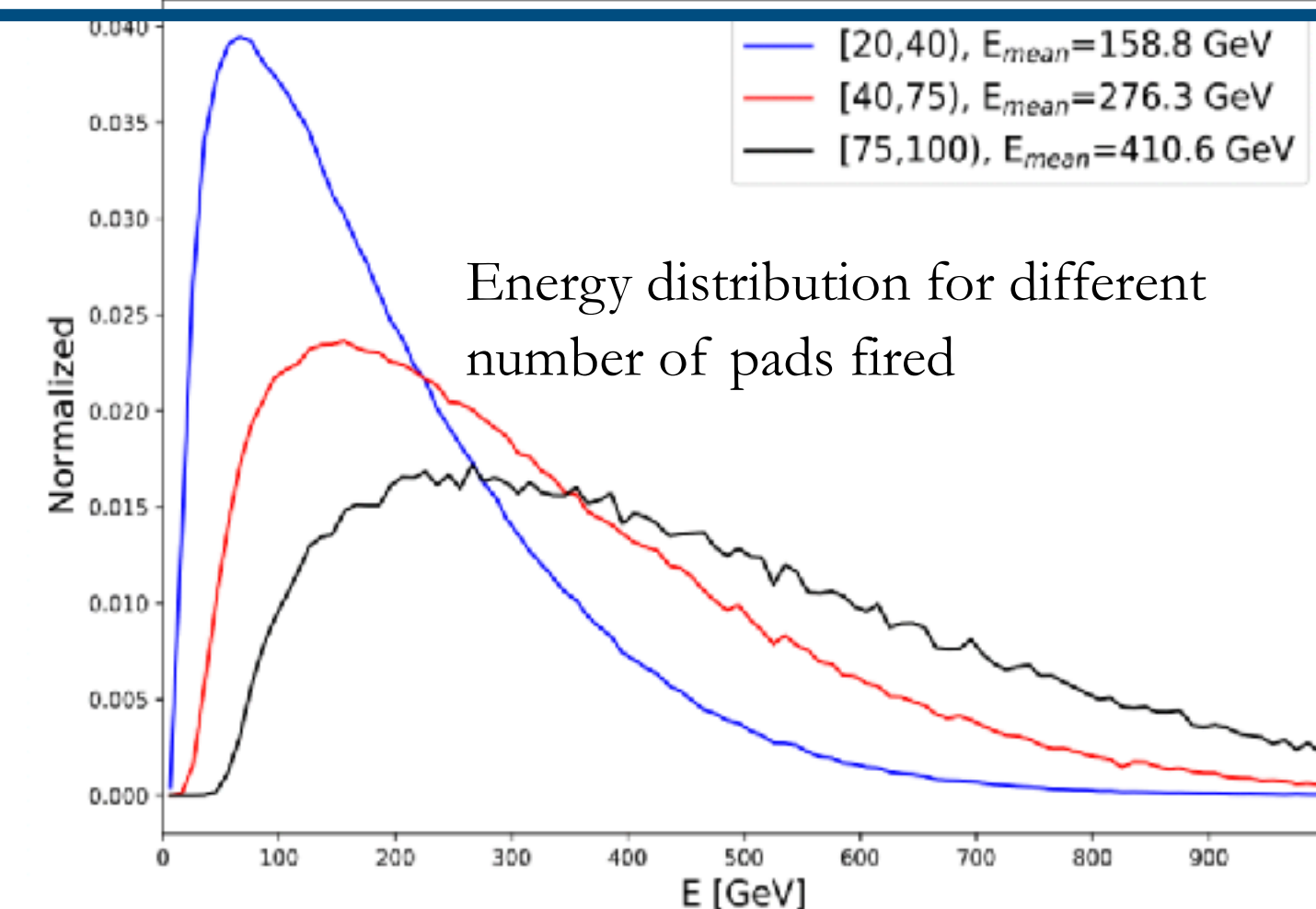
From PNRR to SWGGO: The SWGGO Collaboration accepted to consider a **demonstrator based on RPCs as R&D of the experiment for eventual future upgrade of the system**

• R&D activities:

- RPC layout based on large 40x40 cm² pads
- Studies of performance under different environmental conditions
 - T range (0-30 degrees)
 - Low pressure
 - Alternative ecological gas mixtures
- Performance of combined informations RPC+WCD

• Construction of 100-200 m² of RPC and installation at high altitude

• Simulation studies



SIGLA SWGO sotto dotazioni nel 2025

- **FTE 2025:** 0,7 FTE
 - Piccolo 30% - Meola 30 % - Paoloni 10%
- **Attività a carico LNF (con RM2):**
 - Studio layouts
 - Studi ecogas
 - Test delle camere prodotte
 - test di integrazione a Milano (RPC+WCD): Meccanica, DAQ, prestazioni
 - Installazione e commissioning del dimostratore ad alta quota
- **Richieste CSNII 2025:**
 - Consumo: gas (1 keuro) + missioni: test di integrazione + meeting (3 keuro)
- **Richieste LNF 2025:**
 - Le attività sono integrate nell'ambito delle altre sigle sinergiche
- **Fondi Esterni:**
 - PNRR: 275 Keuro