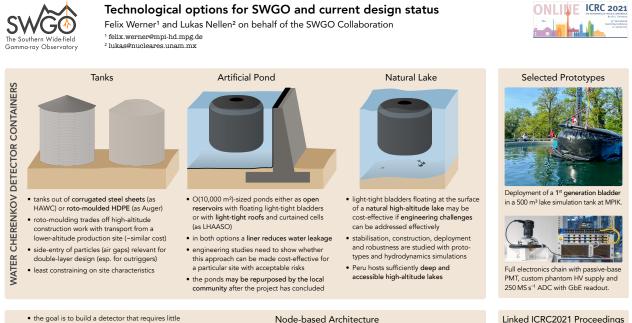
Technological options for the Southern Wide-field Gamma-ray Observatory (SWGO) and current design status

Felix Werner and Lukas Nellen on behalf of the SWGO Collaboration

The SWGO Collaboration is in the process of designing and prototyping a wide field of view, high duty cycle complement to CTA and the existing ground-based particle detectors of the Northern Hemisphere (HAWC and LHAASO). One of the goals is to build a *cost-effective, low-maintenance detector*. We compare various technological options for the design and show a conservative *reference configuration* (for first large-scale simulations and cost comparisons) composed of WCD tanks, large-area PMTs, and waveform-sampling ADCs. We choose a *modular design for the DAQ*, based on commodity network components and focused on moving signal and trigger processing into *software for flexibility*. A *prototype DAQ chain* exists and may be tested in a small tank-based setup in Peru in the next austral summer.

Material

- Proceedings: <u>https://pos.sissa.it/395/714</u>
- Media: https://icrc2021-venue.desy.de/video/Technological-options-for-the-Southern-Wide-field-Gamma-ray-Observatory-SWGO-and-current-design-status/ db9110509a063575bf27ed09ee03a38d



Node-based Architecture

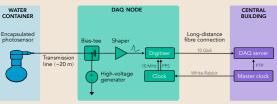
• favour a modular approach based on well-proven technologies such as large-area PMTs and fast pipeline ADCs

or no maintenance over its lifecycle

DAQ

ELECTRONICS &

- active electronics is to be housed in O(100) weatherproof outdoor cabinets, DAQ nodes, each serving tens of detector units
- DAQ nodes transmit waveforms via commodity 10 GbE network devices to central computing for pulse reconstruction, calibration and array-level trigger formation purely in software



Linked ICRC2021 Proceedings This contribution

https://pos.sissa.it/395/714/
SWGO status and prospects
https://pos.sissa.it/395/023/
Lake-based detector studies
https://pos.sissa.it/395/708/
Double-layered WCD design
https://pos.sissa.it/395/902/
Shallow WCD design with 4 PMTs
https://pos.sissa.it/395/707/