

# Construction of an Air Shower Array at the Akeno Observatory

collaboration with  
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ICRR TA and ALPACA members

ALPACA  
SD array  
(next slide)



# ALPACA Array

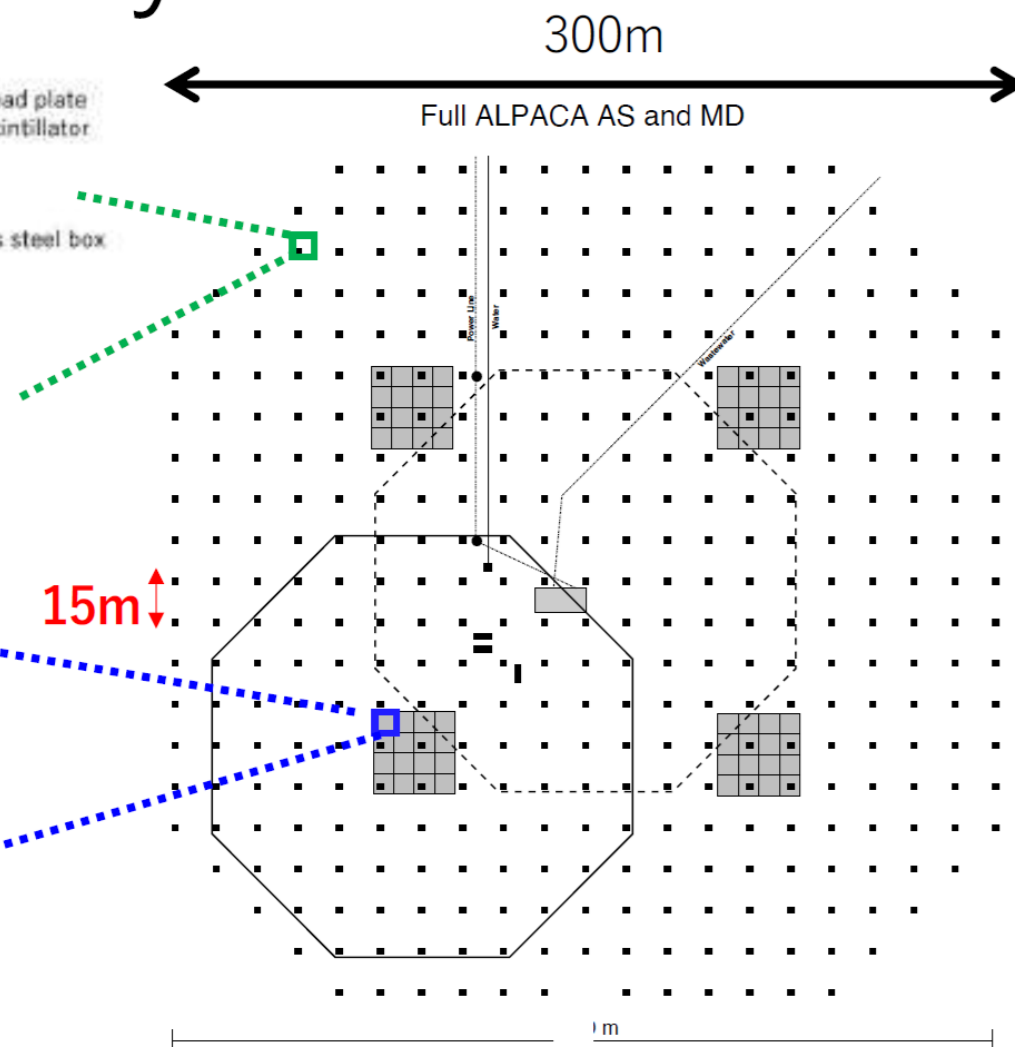
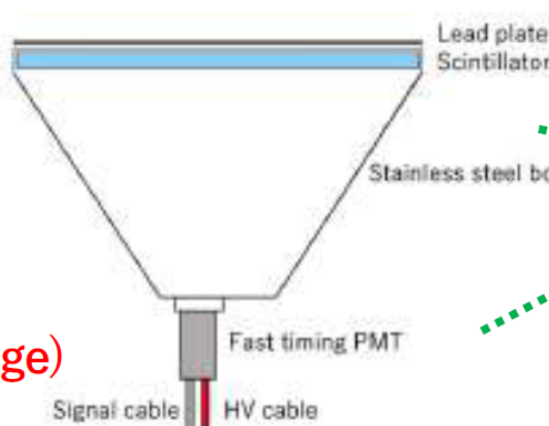
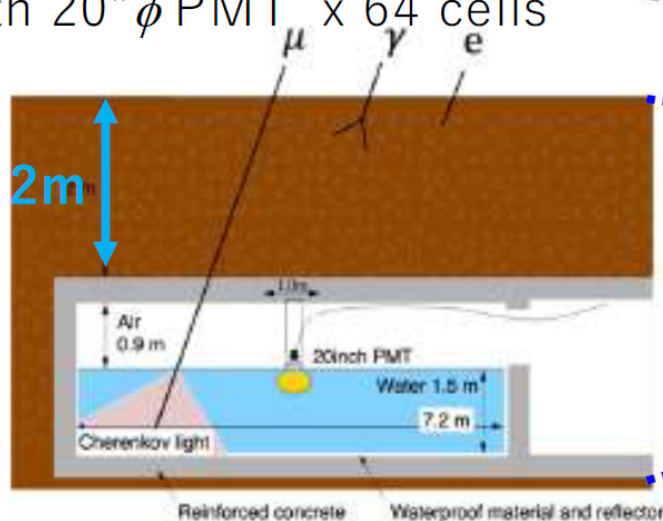
## 1. Array coverage 82,800m<sup>2</sup>

= 401 x 1m<sup>2</sup> plastic scintillators

## 2. Underground water Cherenkov muon detector (MD) 3600m<sup>2</sup>

Soil over 2m ( $\sim 16X_0$ ) (4.3% coverage)

= 58m<sup>2</sup> with 20"  $\phi$  PMT x 64 cells



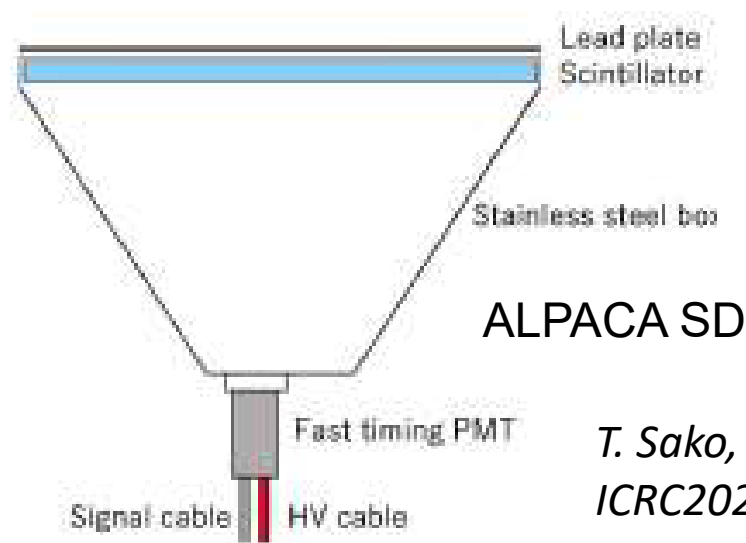
- 1 m<sup>2</sup> AS Detector x (97+304) (82,800 m<sup>2</sup>)
- 56.25 m<sup>2</sup> Muon Detector x (16+48) (3,600 m<sup>2</sup>)

- ✓ Cosmic-ray BG rejection power >99.9% @100TeV.
- ✓ Angular resolution  $\sim 0.2^\circ$  @100TeV, Energy resolution  $\sim 20\%$  @100TeV
- ✓ 100% duty cycle, FOV  $\theta_{zen} < 40^\circ$  (well studied),  $\theta_{zen} < 60^\circ$  (in study)

# ALPACA SD array on the rooftop (plan)



- 9 SDs at the rooftop
- Spacing  $\sim 15$  m
- $E > \sim 100$  PeV energy events
- Observation site:  
altitude: 900 m  
Latitude  $35^{\circ} 47' \text{ N}$ , Longitude  $138^{\circ} 30' \text{ E}$



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# Bilateral project between F.R.S.-FNRS and JSPS



- Construct a layered SD in the Akeno observatory
- Trigger signal from the ALPACA SD array

# Summary

- ALPACA SD array will provide a trigger signal of  $\sim 100$  PeV air showers.
- Next step: discussion on the detailed hardware setup
- This setup will enable tests with a layered water tank in Japan.