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Operations of the LHAASO-WCDA

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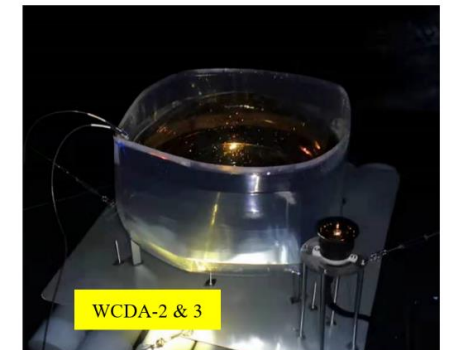
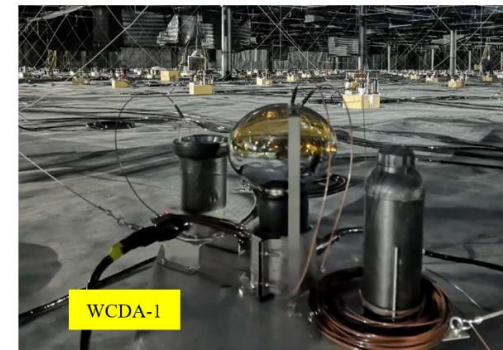
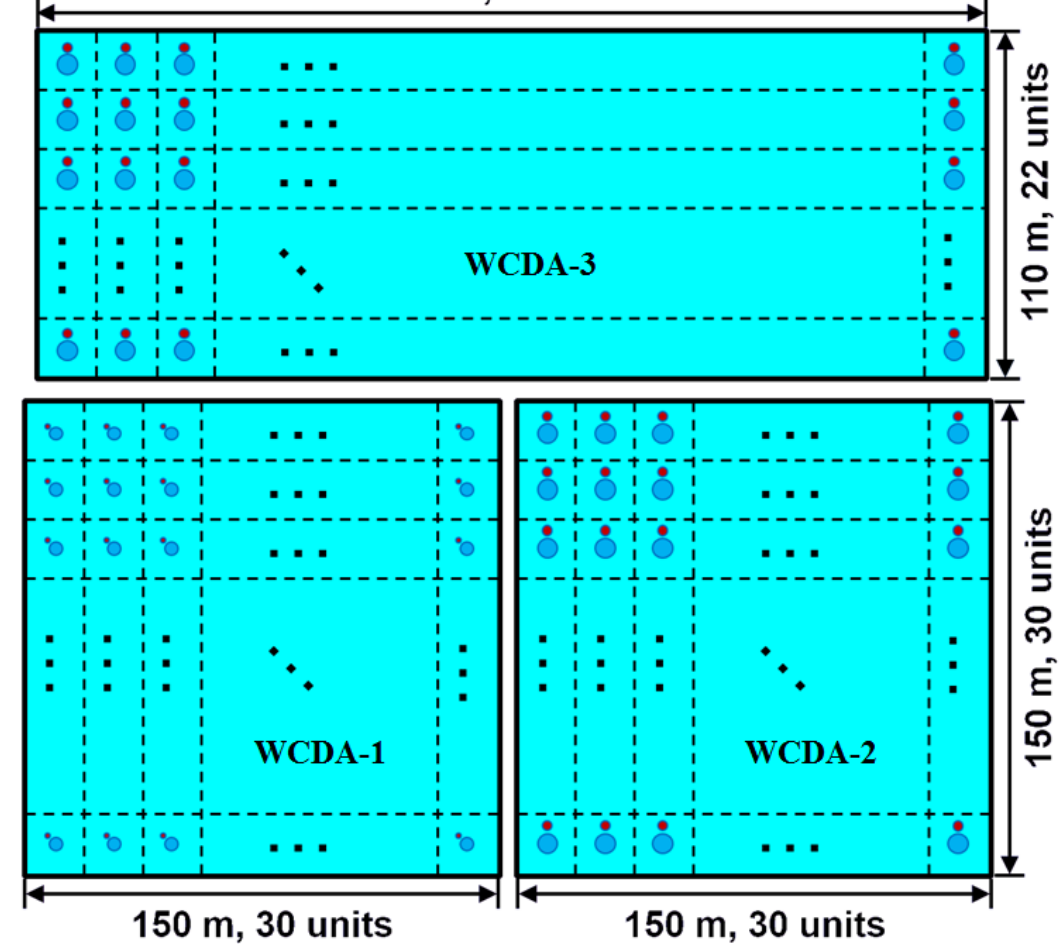
16 July, 2021

LHAASO-WCDA

- $\sim 100\text{GeV} - 30\text{TeV}$ gamma-ray sky
- Divided into 3 separate arrays
 - WCDA-1: 8 + 1.5inch PMT
 - WCDA-2 & 3: 20 + 3inch PMT
- Cell: $5\text{m} \times 5\text{m}$, 3120 cells

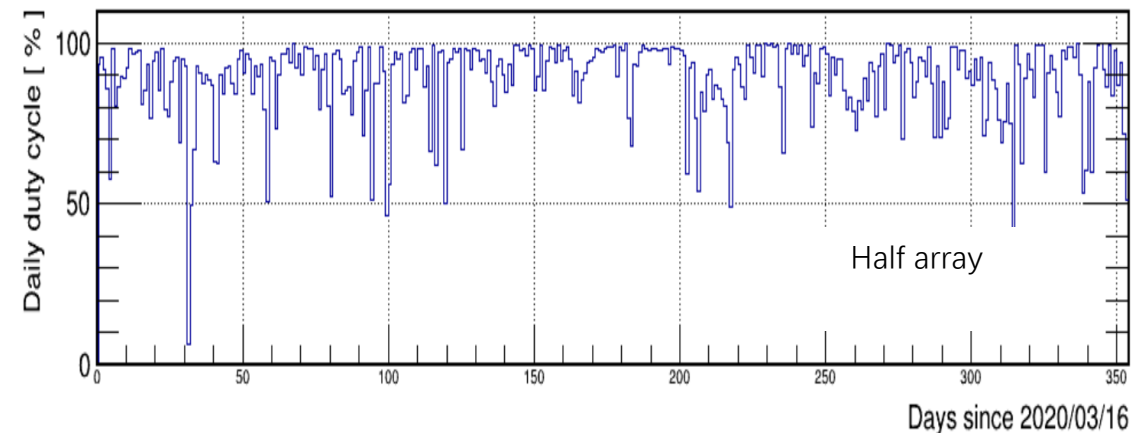
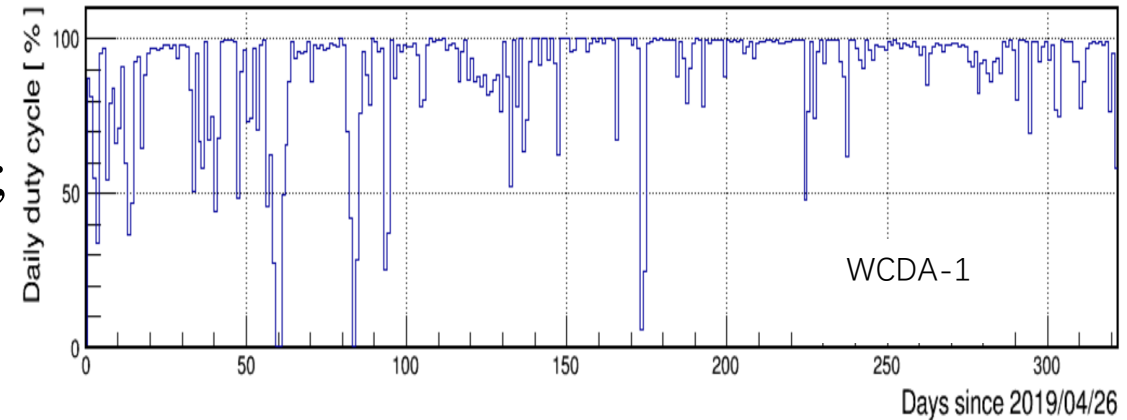
PMT	TTS (ns)	Dynamic range (PEs)	Manufacturer	Model number	Layout
8-inch	<3	1 - 4,000	Hamamatsu	CR-365	WCDA-1
1.5-inch	-	20 - 200,000	HZC Photonics	XP-3960	WCDA-1
20-inch	<6.5	1 - 1,800	NNVT	GDB-6203	WCDA-2&3
3-inch	-	1 - 3,000	HZC Photonics	XP-72B22	WCDA-2&3

More information and performance of PMTs are presented in ID-167, 1126, 1164



Operations of the LHAASO-WCDA

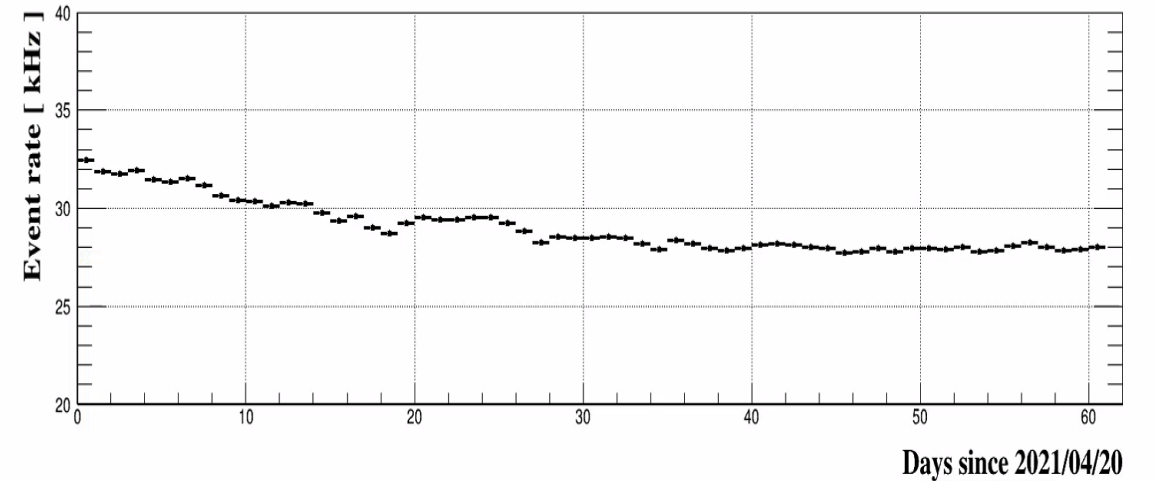
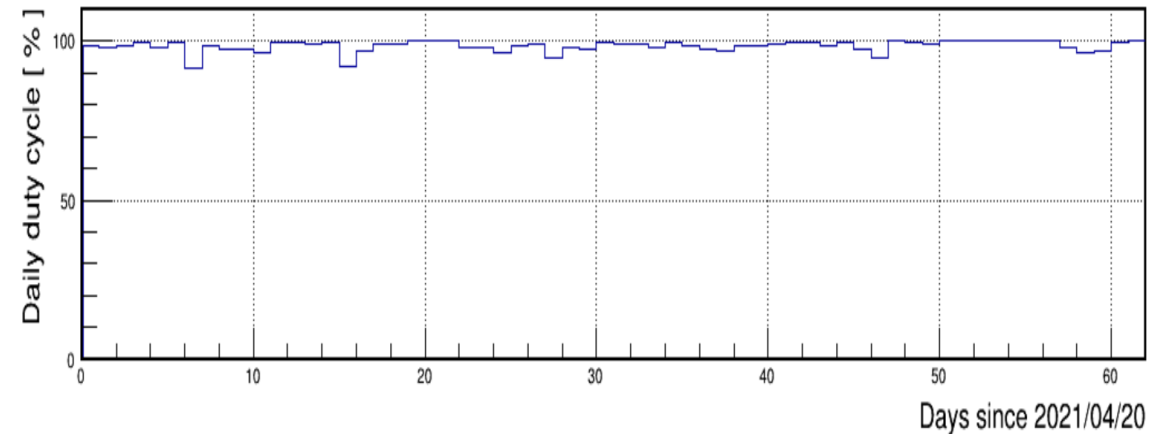
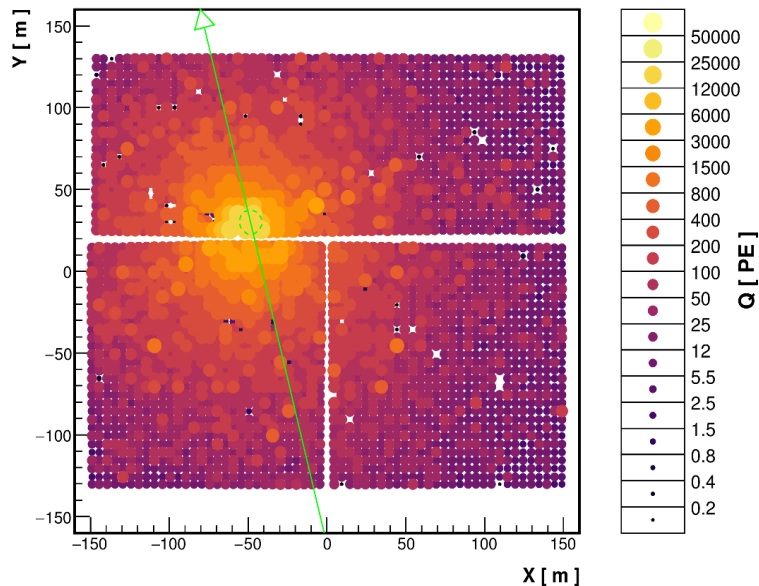
- **WCDA-1** (2019/4/16 - 2020/3/12):
 - Trigger scheme: 1/3PE, 20 groups in 300 ns;
 - Trigger rate: ~20 kHz, 3TB/day;
- **Half array** (2020/3/16 – 2021/3/4):
 - WCDA-1 & WCDA-2
 - Add magnetic shielding in October 2020
 - Trigger scheme: 1/3PE, the multiple zoned pattern
 - Rate: ~80kHz, 15 TB/day;



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- Full array (2021/3/5 – now):
 - Trigger scheme: 1PE for 20-inch PMT, 30 hits/cluster;
 - Rate: stabilized at about 28kHz, 12TB/day;

20210627/114538/0.035432442: nTrig=-1, $\theta=18.70\pm 0.01^\circ$, $\phi=283.79\pm 0.03^\circ$



Summary

- Objective: $\sim 100\text{GeV} - 30\text{TeV}$ gamma-ray sky;
- Divided into 3 separate arrays:
 - WCDA-1: 8 + 1.5inch PMT
 - WCDA-2 & 3: 20 + 3inch PMT
- Three phases:
 - WCDA-1 (2019/4/16 - 2020/3/12);
 - Half array (2020/3/16 – 2021/3/4);
 - Full array (2021/3/5 – now).

The preliminary analysis results are presented in other contribution in this conference: ID-897, 969, 1079, 1081, 1103.

PMT	TTS (ns)	Dynamic range (PEs)	Manufacturer	Model number	Layout
8-inch	<3	1 - 4,000	Hamamatsu	CR-365	WCDA-1
1.5-inch	-	20 - 200,000	HZC Photonics	XP-3960	WCDA-1
20-inch	<6.5	1 - 1,800	NNVT	GDB-6203	WCDA-2&3
3-inch	-	1 - 3,000	HZC Photonics	XP-72B22	WCDA-2&3

Phases	Threshold (PEs)	Trigger scheme	Rate (kHz)	Raw data (TB/day)
WCDA-1	1/3	20 groups	20	3
Half array	1/3	15, pattern	80	15
Full array	8inch: 1/3 20inch: 1	30, pattern	30	12