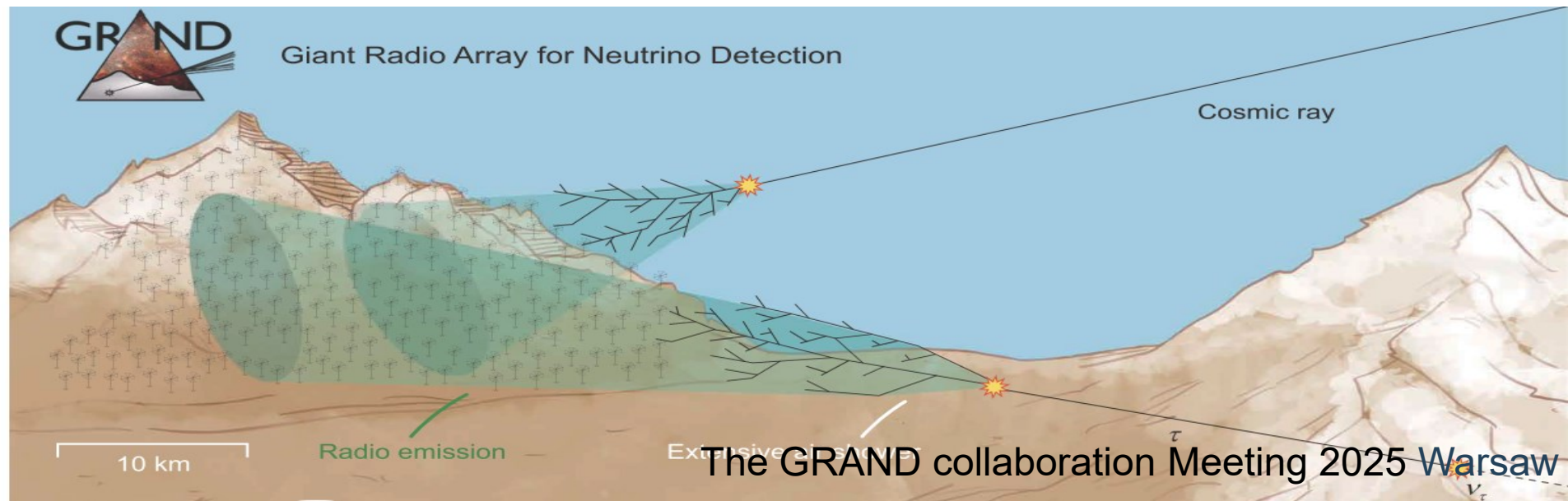




Status of GP300

Yi Zhang (张毅) ,

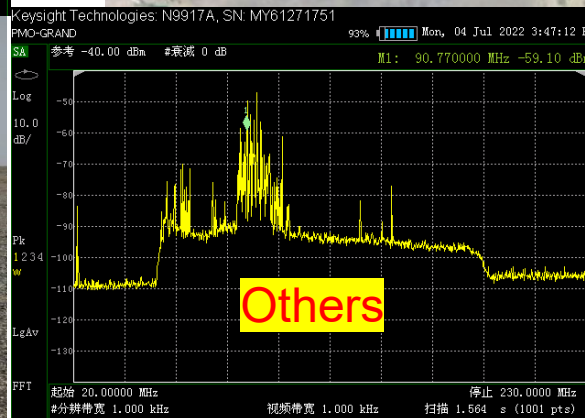
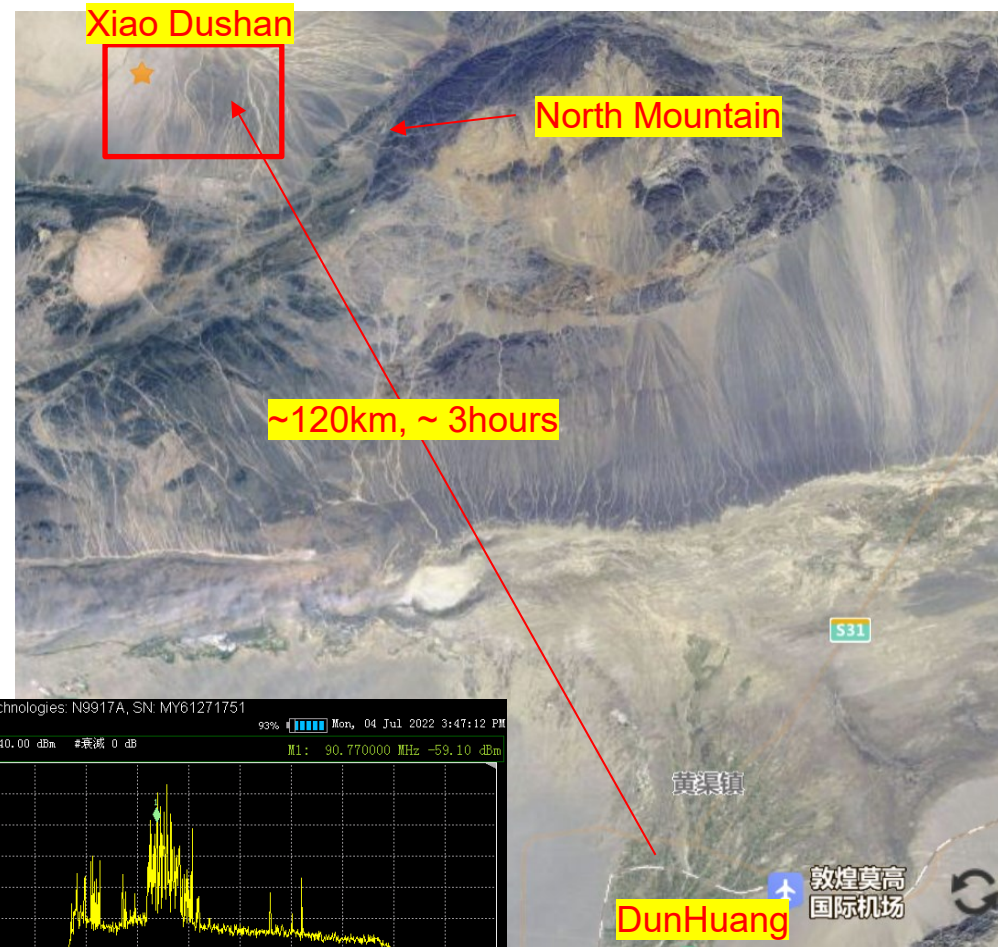
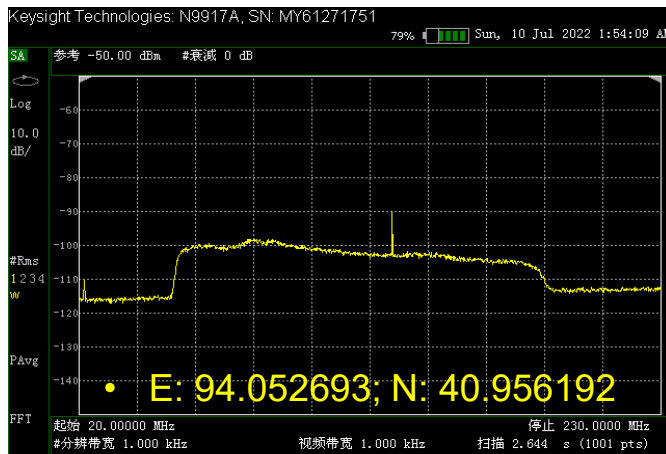
Pengxiong Ma, Xing Xu, Pengfei Zhang



Site of GP300



- **Xiao Dushan (小独山) :**
Alt. avg. 1100m
- ~120km from Dunhuang 敦煌,
~3 hours by car
- Very good radio background





GP300 Land Use Approval in 2024



敦煌市自然资源局文件

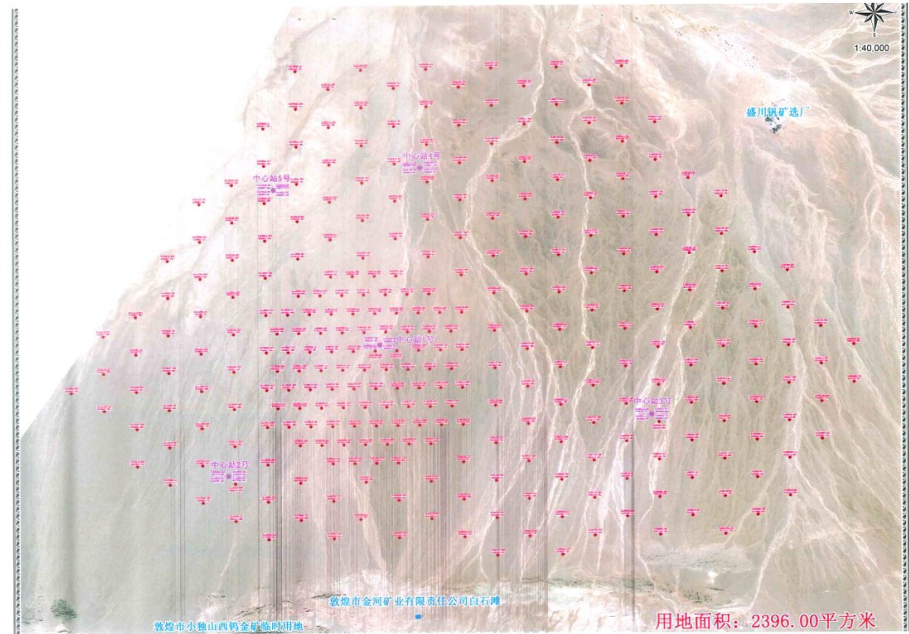
敦自然资发〔2024〕23号

敦煌市自然资源局 关于大型中微子射电观测站二期子阵项目用地 准予备案的通知

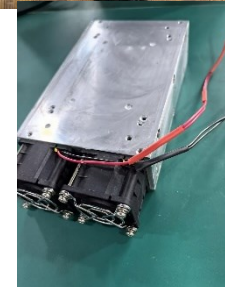
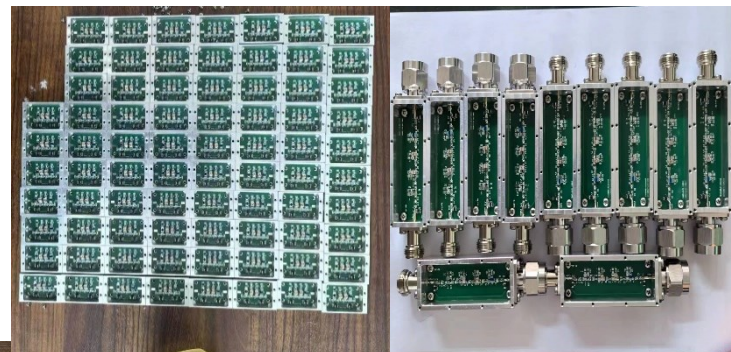
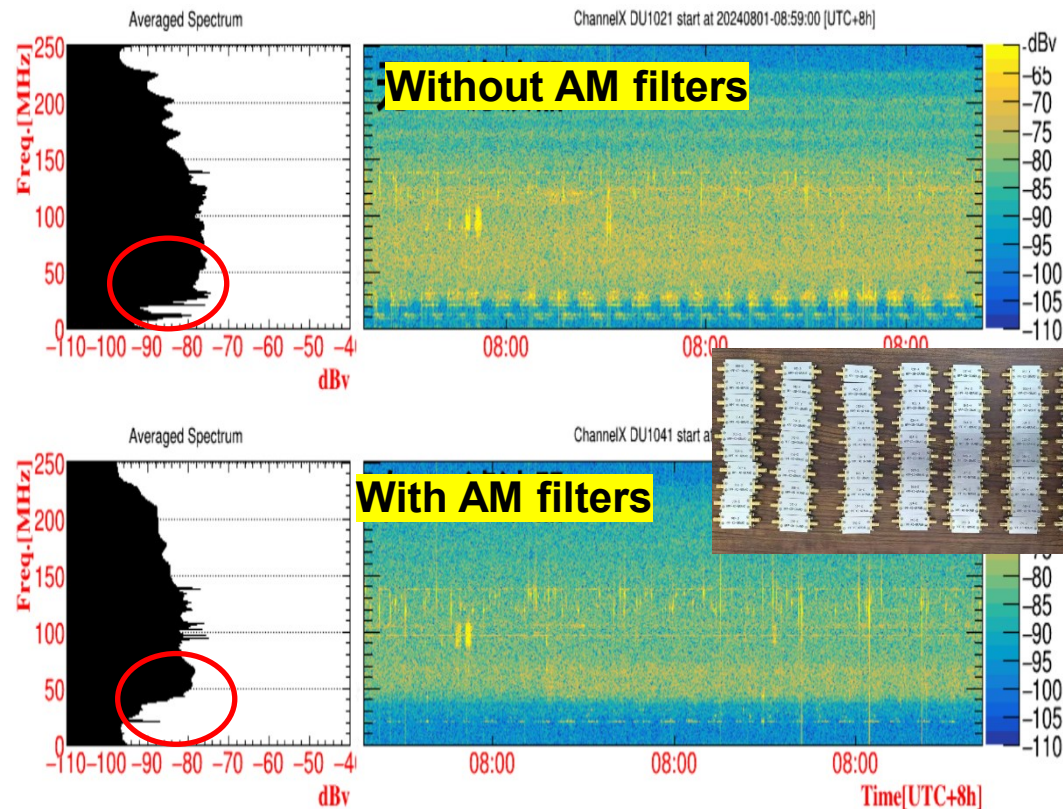
中国科学院紫金山天文台：

参照原国土资源部、发展改革委等部委《关于支持新产业新业态发展促进大众创业万众创新用地的意见》（国土资规〔2015〕5号）相关规定，经上报市政府批准，现准予你单位以现状备案方式使用我市北山小独山区域2396平方米国有土地，用于大型中

2024-4-28



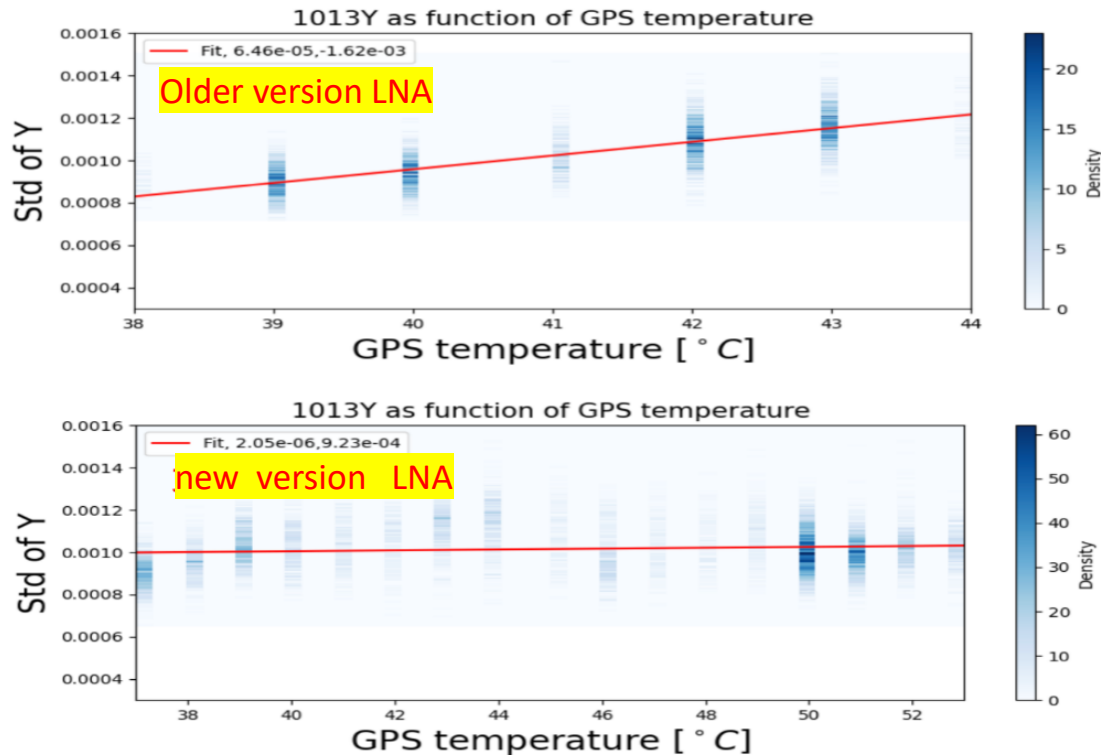
On-Site Installation Team In Apr. 2024



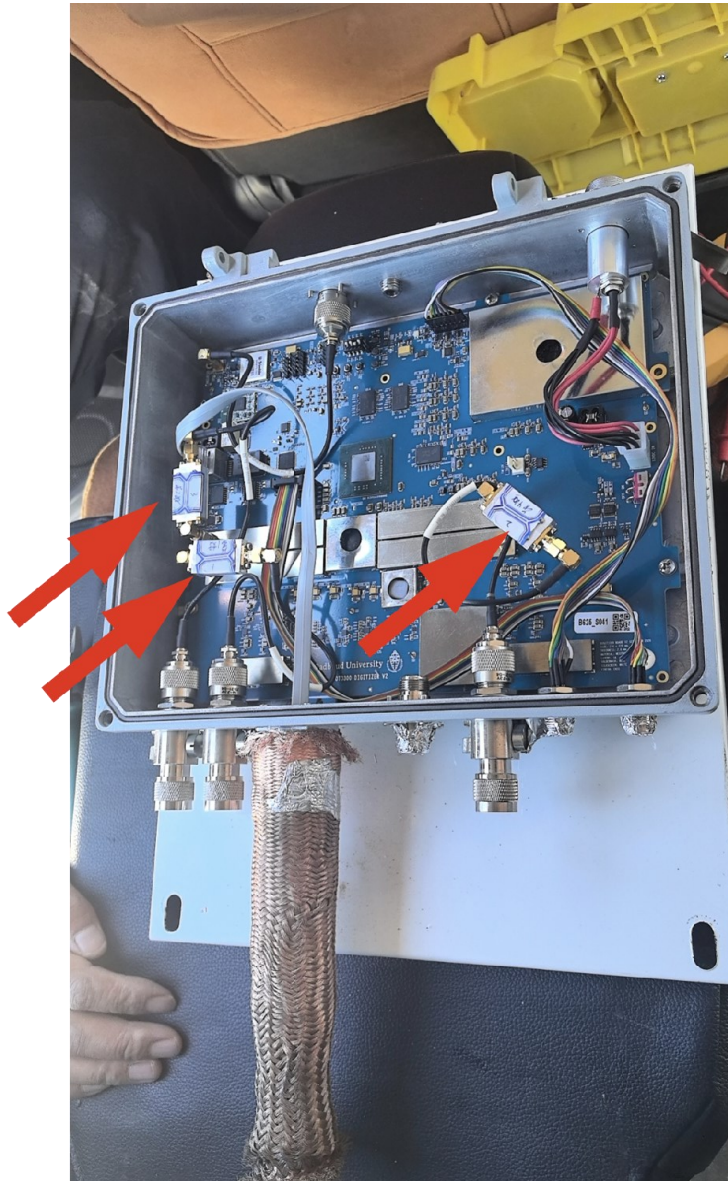
During the summer, AM background signals appear at the site, so we will install a new AMs to all units to suppress it.



Upgrade the low-noise amplifier (LNA)



Redesign and update the LNAs in all units to reduce the temperature dependency of the gain.



Hardware:

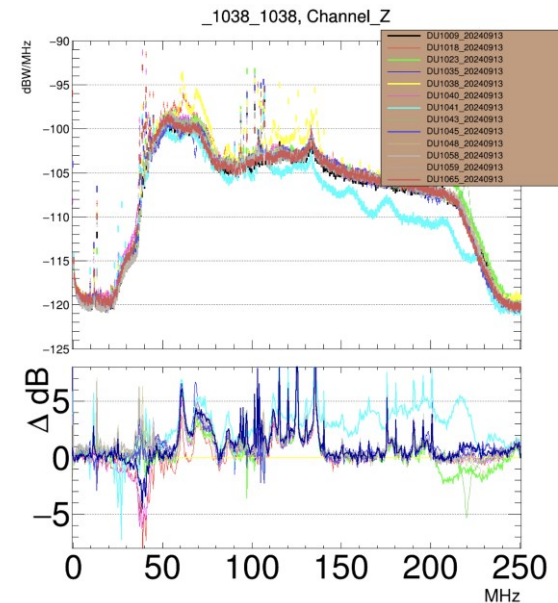
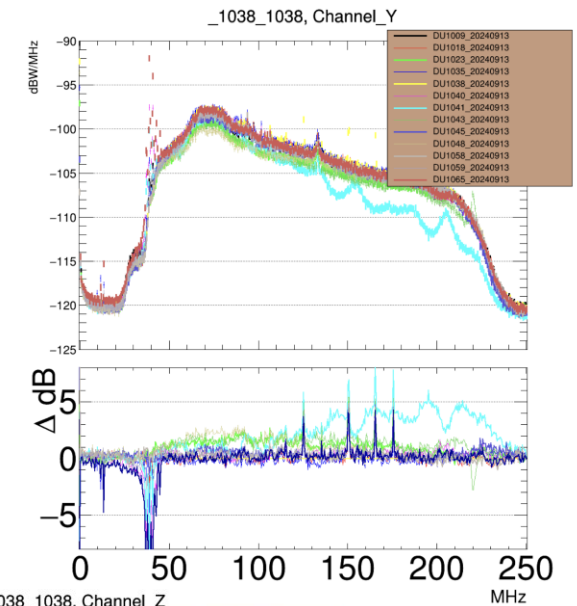
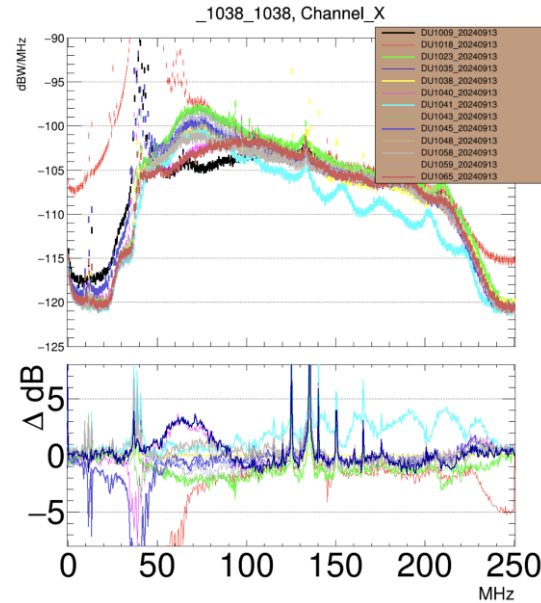
- Install new AM filters with a compact design
- New matching network inside the NUT
- Direct Bullet connection to the FEB box
- Install LNAs with reduced temperature dependence

Firmware Updating:

- Remote update module
- Automatic reboot module



2024-Sep, Oct on-site



➤ Diode is removed for all GP13 DUs.

➤ Highly consistent spectrum.



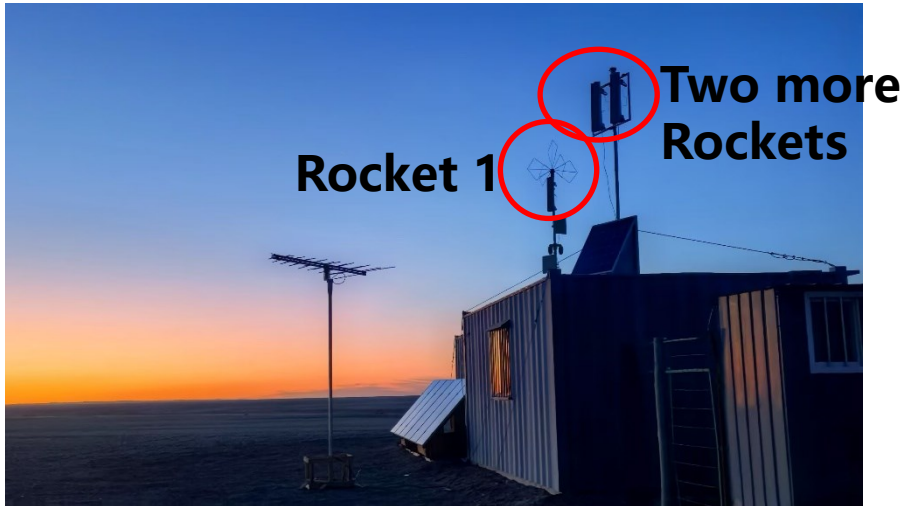
2024-Sep, Oct on-site



New Central station



New deployed Rockets



No.1 Central station

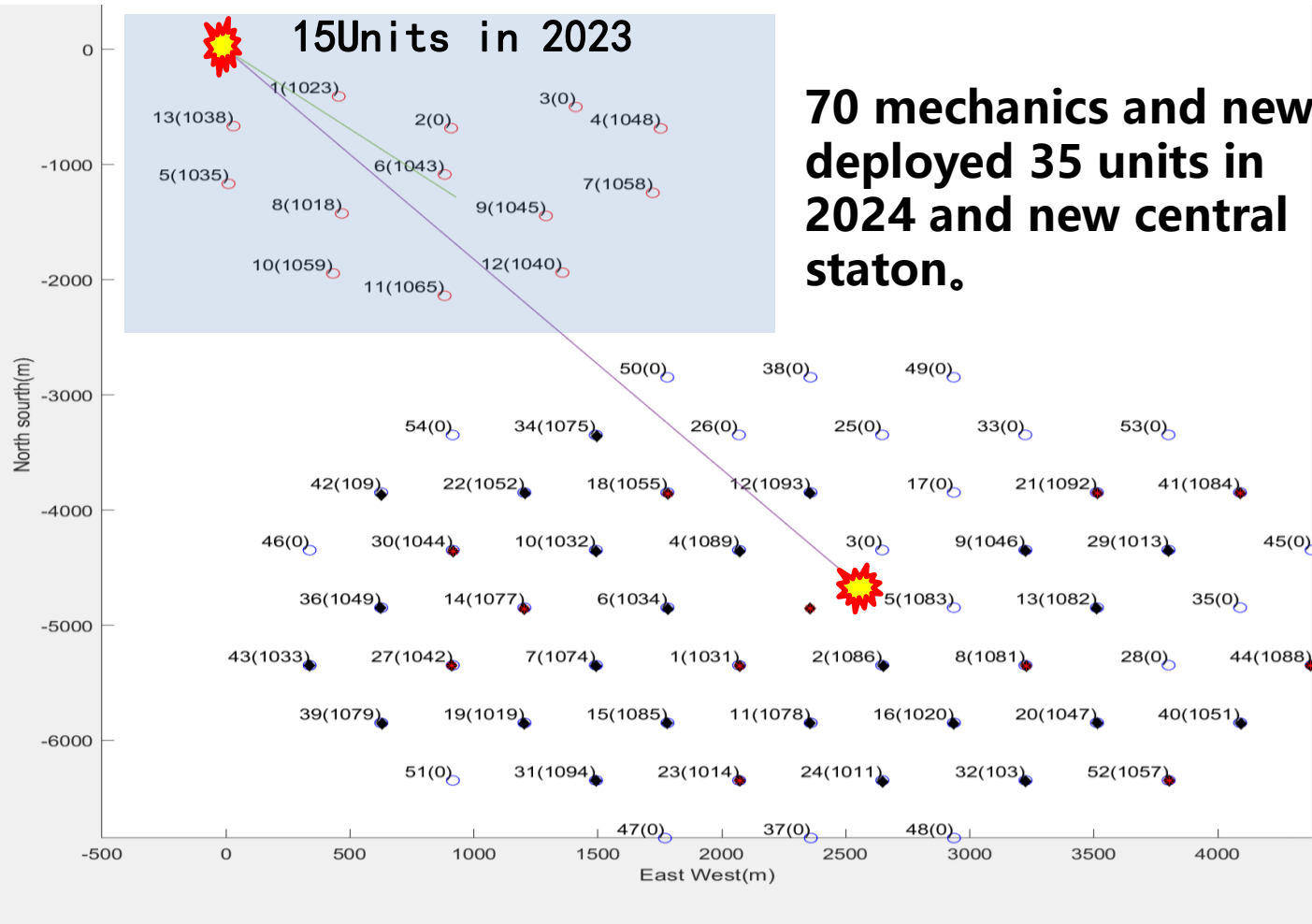


No.2 Central station

✓ Optimize wireless data transmission



Progress in 2024



2024-09



2024-10

In 2024, teams were organized three times—in early September, early October, and late October—to complete the installation of the mechanical structures for 70 detectors, expand the antenna array to 48 units, and add a new central station.



More notch filters in the firmware

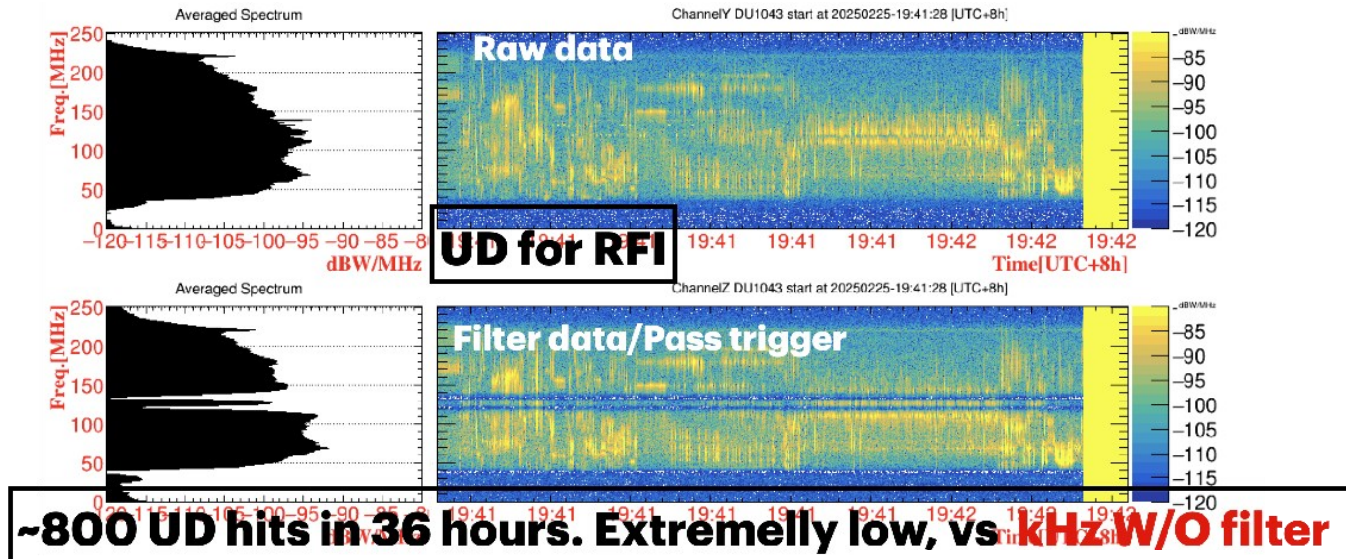


Phase 1. GP35 only. Dec. 5 - 18 in 2024. T1 online, CD offline.

Phase 2. GP35+GP13. Dec.18.2024 - Janu. 16 2025, T1 online, CD offline.

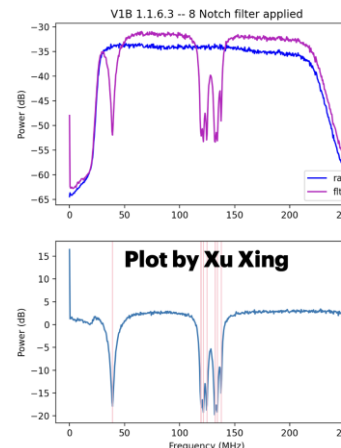
Phase 3. GP35+GP13, starting on Janu. 16 2025 - Feb 04, T1 online, CD offline with only Y channel triggering.

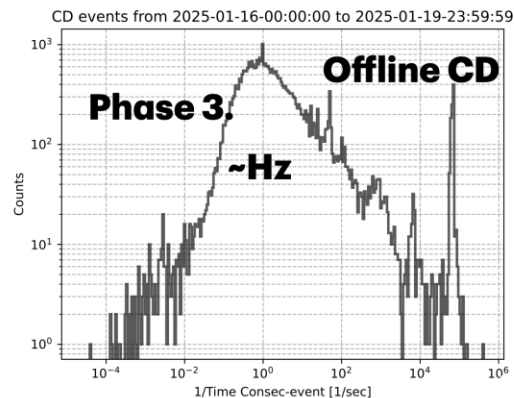
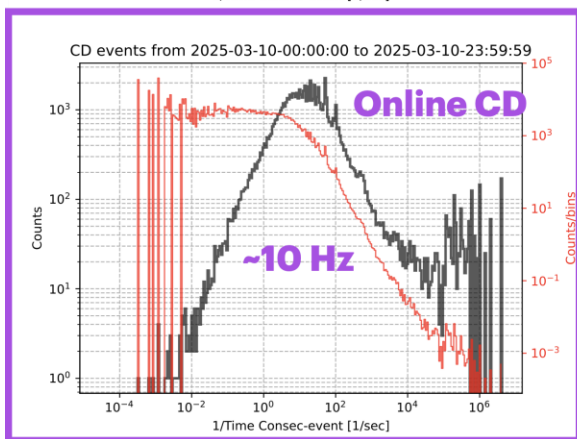
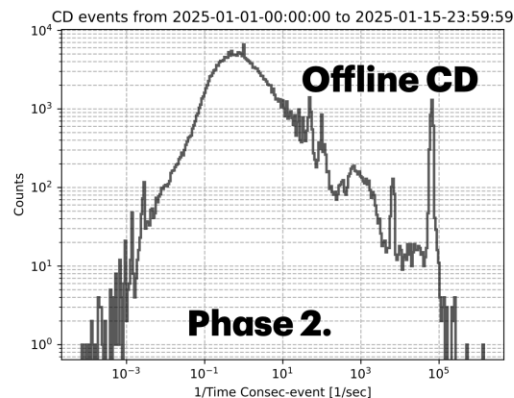
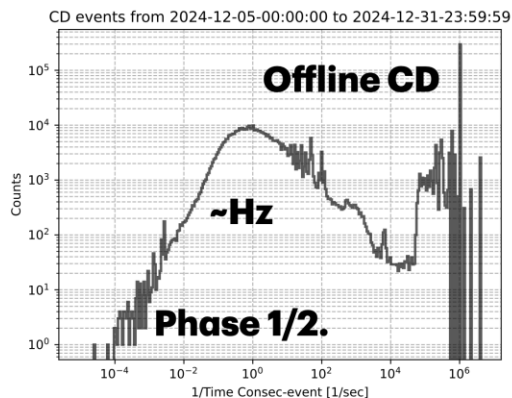
Phase 4 : GP35+GP13, Feb 14-Feb 19 offline.



```
Filter1:  
- 39  
- 0.9  
Filter2:  
- 119.4  
- 0.94  
Filter3:  
- 132  
- 0.95  
Filter4:  
- 137.8  
- 0.98  
Filter5:  
- 121.5  
- 0.96  
Filter6:  
- 134.2  
- 0.96  
Filter7:  
- 137.8  
- 0.98  
Filter8:  
- 137.8  
- 0.98
```

RFI between 119 MHz-140 MHz confirmed, more notch filters (8 most) introduced in firmware.

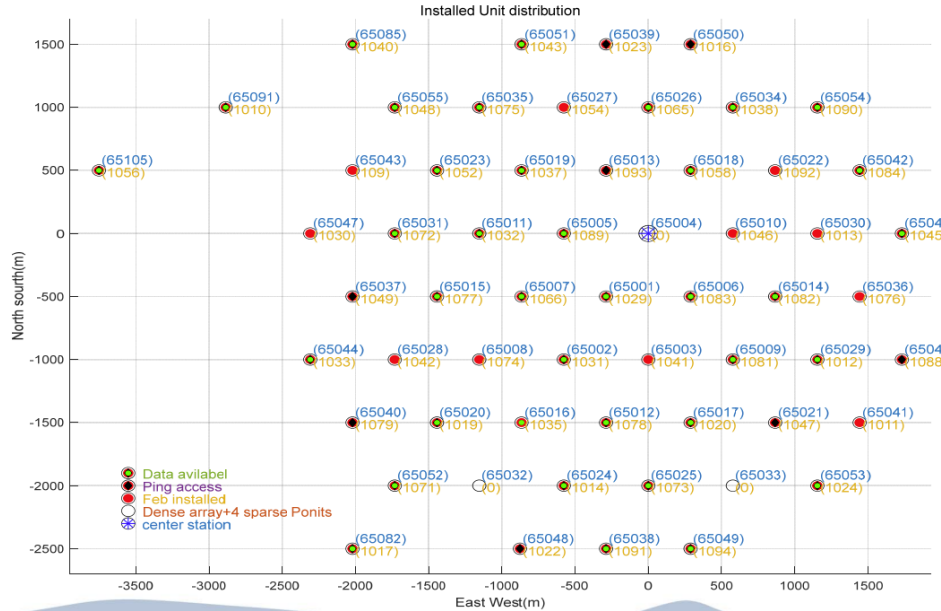




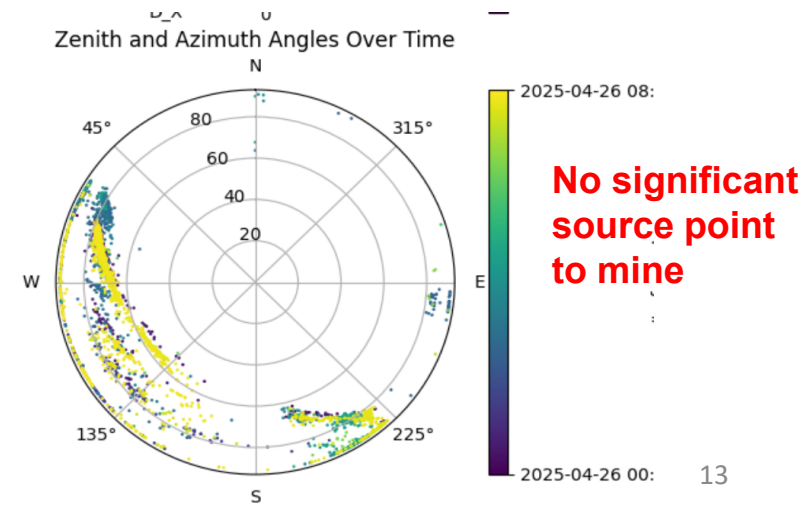
- Old setup: NC[2-13], TCmax=14ns, T_period=1330ns, T_quiet=500ns. 4DUs/14000ns
- New setup: NC[2-10], TCmax=200(100)ns, T_period=1000ns, T_quiet=500ns. 4DUs/14000ns
- Online CD is improved and re-started, it works better and smoothly thanks to Bohao's efforts (Stay optimized)



2025-04 on site

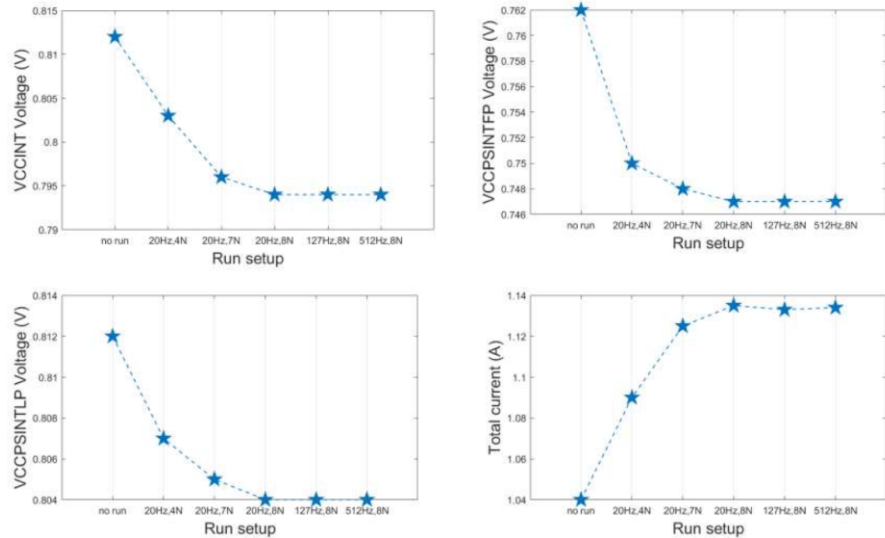


Deploy of GP65 array



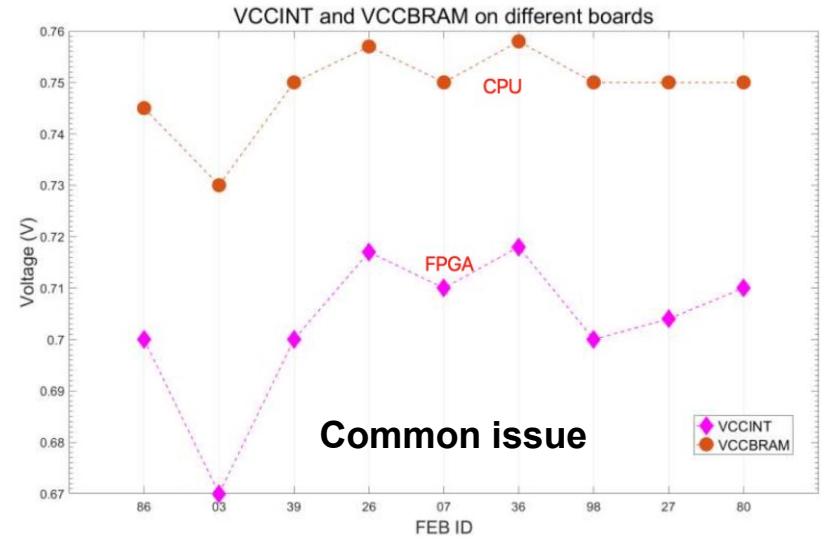
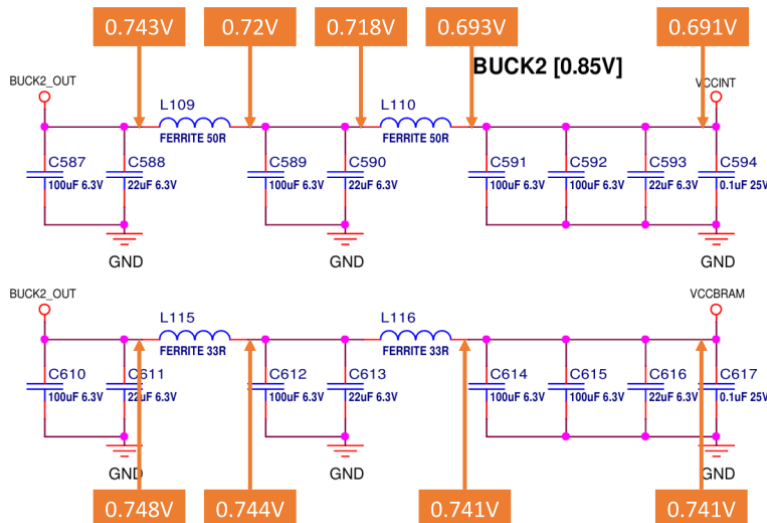


FEB powers voltage and total current variation under different running conditions



*N: Notch

Power consumption



Common issue

- Problematic ferrites are likely causing the low current on the FEB, which makes the FEB unstable when power consumption increases.
- The latest replacement tests show the FEB has very good stability over 24 hours in the lab.



Summary



- 1) Increased the number of installed detectors. Currently, we are at the GP65 stage, having completed a total of 65 installations. GP13 has been moved to GP65.
- 2) Added a central station plus 2 more receivers.
- 3) Added hardware AM filters and reduce the temperature dependence of the LNA.
- 4) Added four north-filters in the firmware to effectively identify noise interference from mines.
- 5) Discovered a voltage insufficiency issue as power consumption increases and provided potential solutions.



Problems to solve



- **Firmware:**
 - **Remote firmware upgrade**
 - **Petalinux upgrade**
 - **DU disconnection**
- **Data transmission from DUs to CS:**
 - **Data communication speed decreases when the central station communicates with multiple DUs.**
- **Robust shielding;**
- **L1 Trigger logic (optimize trigger parameters) to reduce triggering from airplane signals.**
- **Ferrites issue;**