# The LRA on Compass M1 and Laser Ranging Experiment

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| | |
|---|---|
| Size | 31.6×28 cm |
| Diameter of corner cube | 33mm |
| Number | 42 |
| Reflective area | 360cm$^2$ |
| Material | fused silica |
| Weight | 2.5 kg |

The corner cubes are uncoated both front and back surfaces

# The LRA on Compass M1

# Upgrading of Changchun SLR

- New laser: (a loan from NCRIEO)

  Active-active mode locked Nd:YAG laser

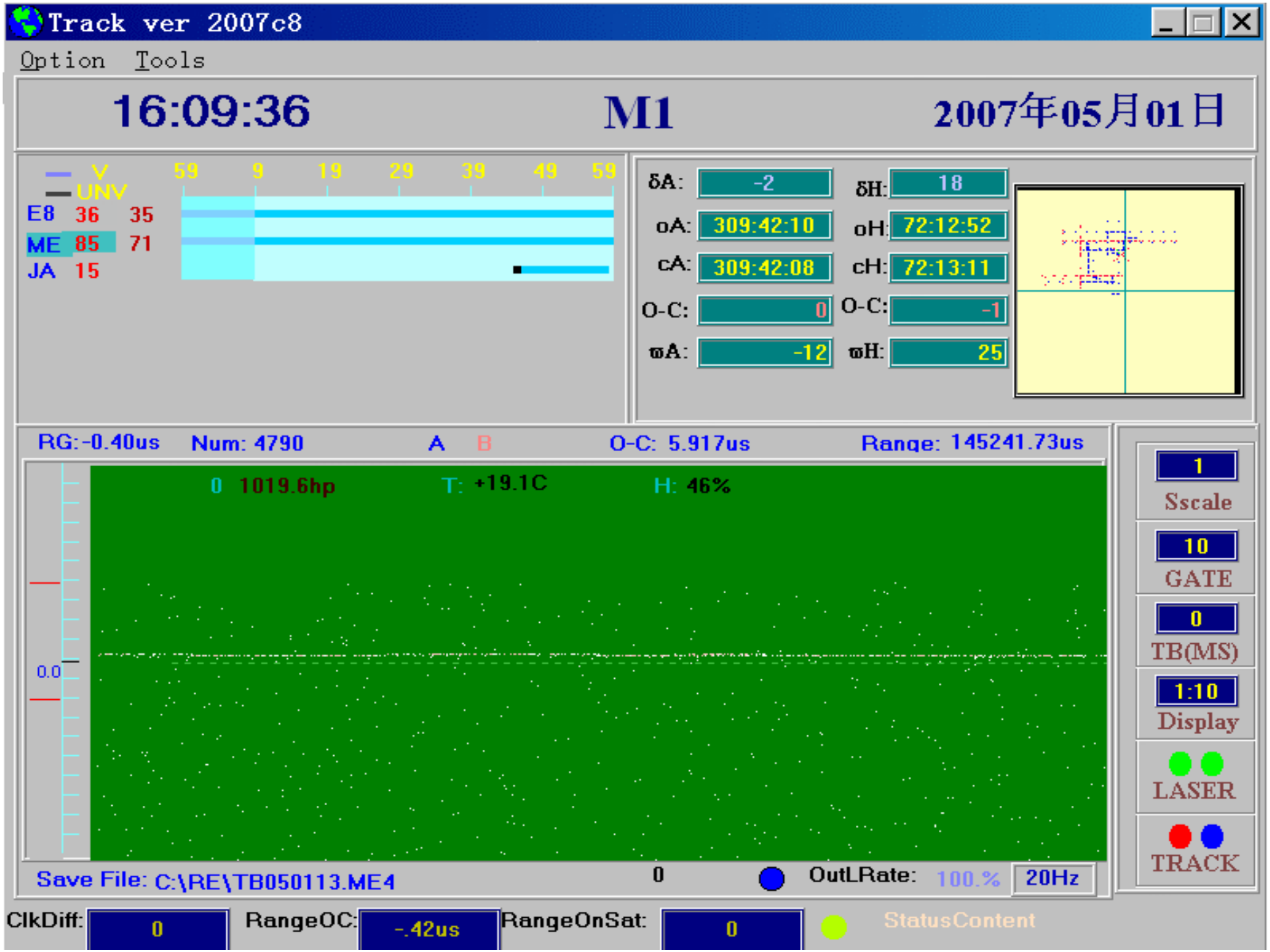
  100-150mJ in 532nm, 250ps, 20Hz
- New Coude mirrors
- 210mm diameter transmitting telescope

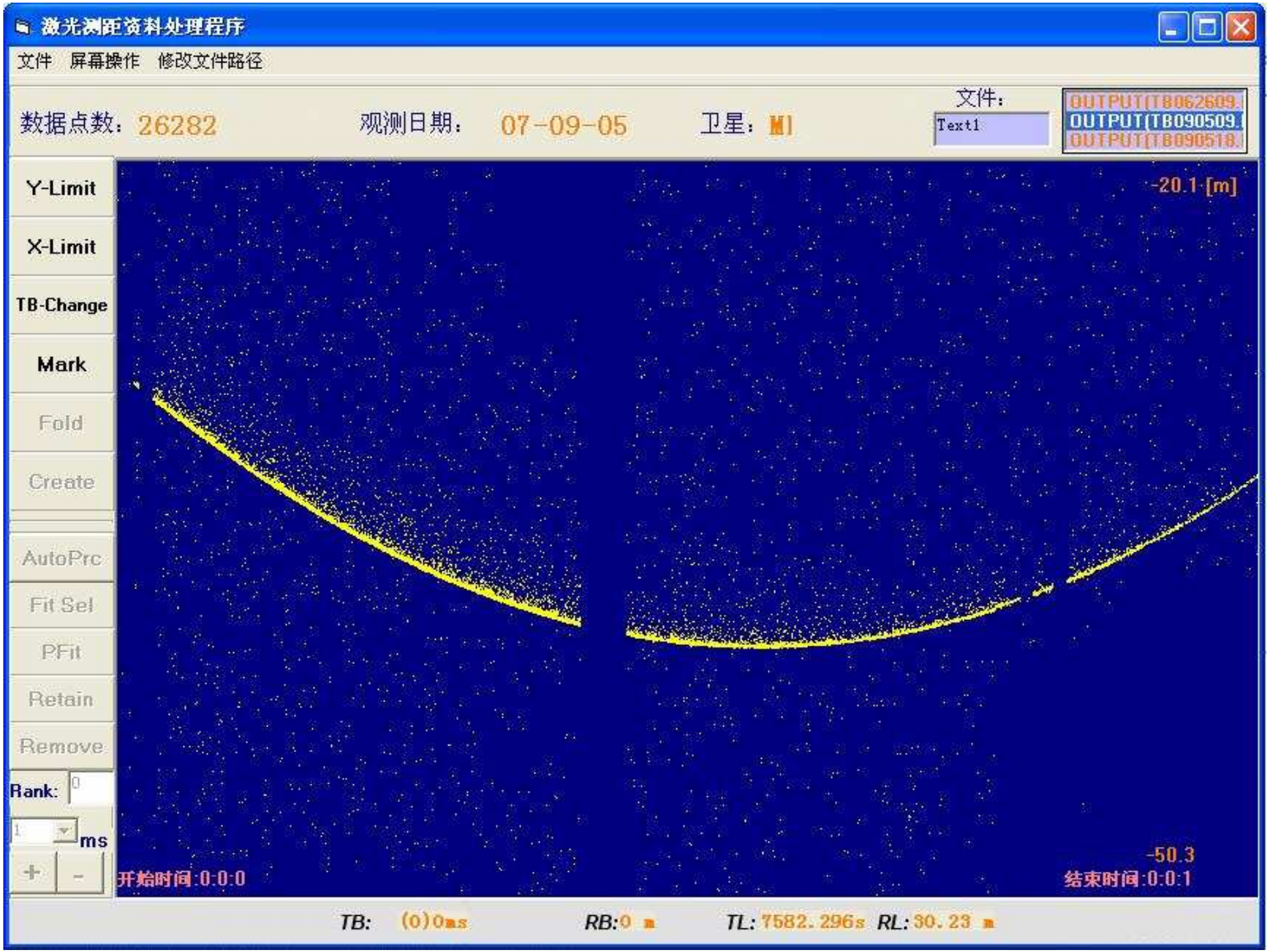
  10 aresec laser beam divergency
- 2 sets of event timer (Riga Univ.)

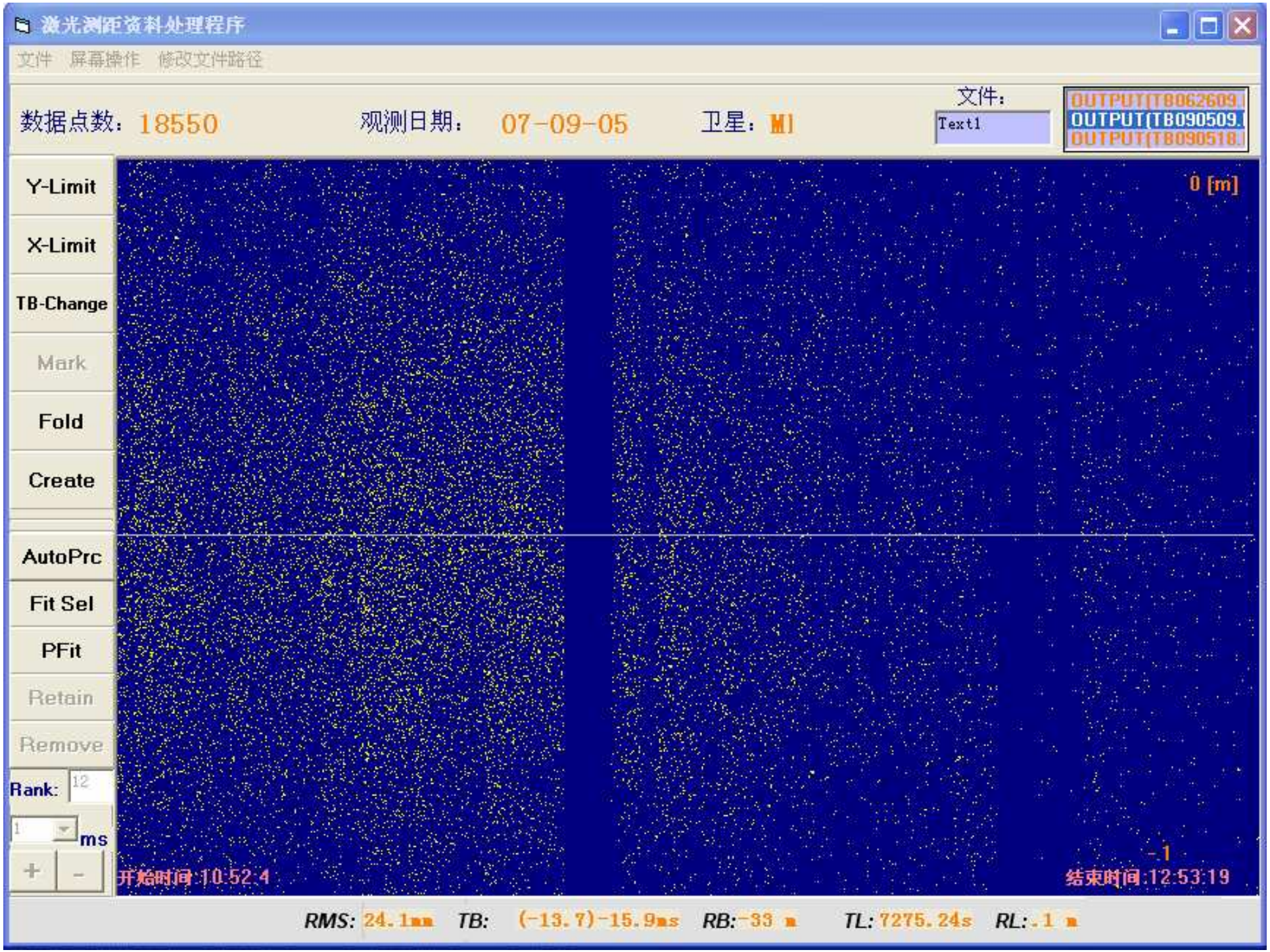

Active-active mode-locked Nd:YAG laser
100-150mJ (532nm), 250ps, 20Hz
2007/06/14 08:49

# Changchun SLR Telescope


Changchun SLR Control Room


Track ver 2007c8
Option Tools
16:09:36
M1
2007年05月01日
V
UNV
E8 36 35
ME 85 71
JA 15
59 9 19 29 39 49 59
δA: -2
δH: 18
oA: 309:42:10
oH: 72:12:52
cA: 309:42:08
cH: 72:13:11
O-C: 0
O-C: -1
ωA: -12
ωH: 25
RG:-0.40us Num: 4790 A B O-C: 5.917us Range: 145241.73us
0 1019.6hp T: +19.1C H: 46%
0.0
Save File: C:\RE\TB050113.ME4
0
OutLRate: 100.% 20Hz
1
Sscale
10
GATE
0
TB(MS)
1:10
Display
LASER
TRACK
ClkDiff: 0
RangeOC: -.42us
RangeOnSat: 0
StatusContent

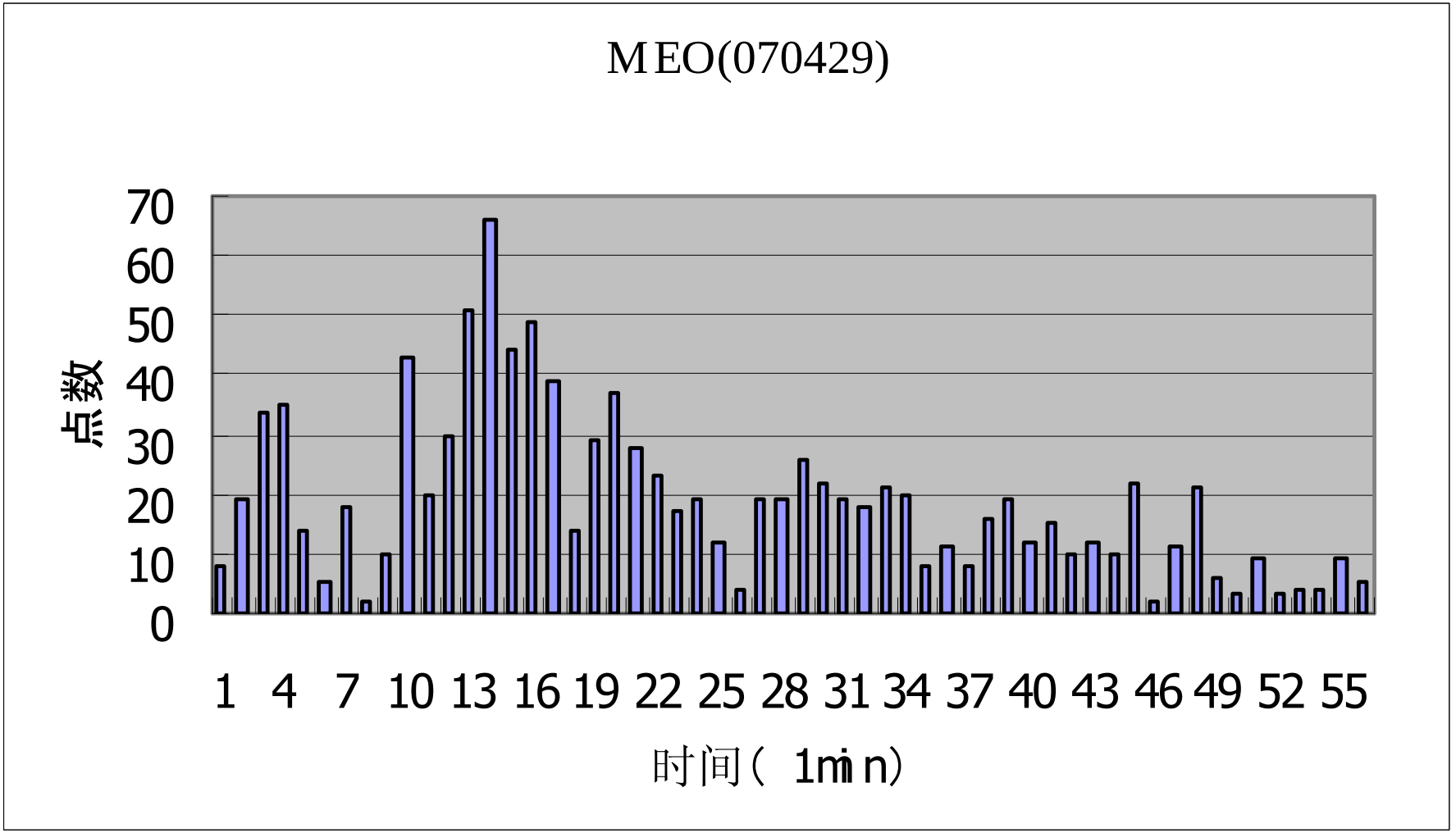

激光测距资料处理程序
文件 屏幕操作 修改文件路径
数据点数: 26282
观测日期: 07-09-05
卫星: MI
文件:
Text1
OUTPUT(TB062609.
OUTPUT(TB090509.
OUTPUT(TB090518.
Y-Limit
X-Limit
TB-Change
Mark
Fold
Create
AutoPrc
Fit Sel
PFit
Retain
Remove
Rank:
ms
-20.1 [m]
-50.3
开始时间:0:0:0
结束时间:0:0:1
TB: (0)0ms
RB:0 m
TL:7582.296s RL:30.23 m


激光测距资料处理程序
文件 屏幕操作 修改文件路径
数据点数: 18550
观测日期: 07-09-05
卫星: MI
文件:
Text1
OUTPUT(T8062609.
OUTPUT(T8090509.
OUTPUT(T8090518.
Y-Limit
X-Limit
TB-Change
Mark
Fold
Create
AutoPrc
Fit Sel
PFit
Retain
Remove
Rank:
12
1
ms
+
-
0 [m]
-1
开始时间:10:52:4
结束时间:12:53:19
RMS: 24.1mm TB: (-13.7)-15.9ms RB:-33 m TL:7275.24s RL:.1 m

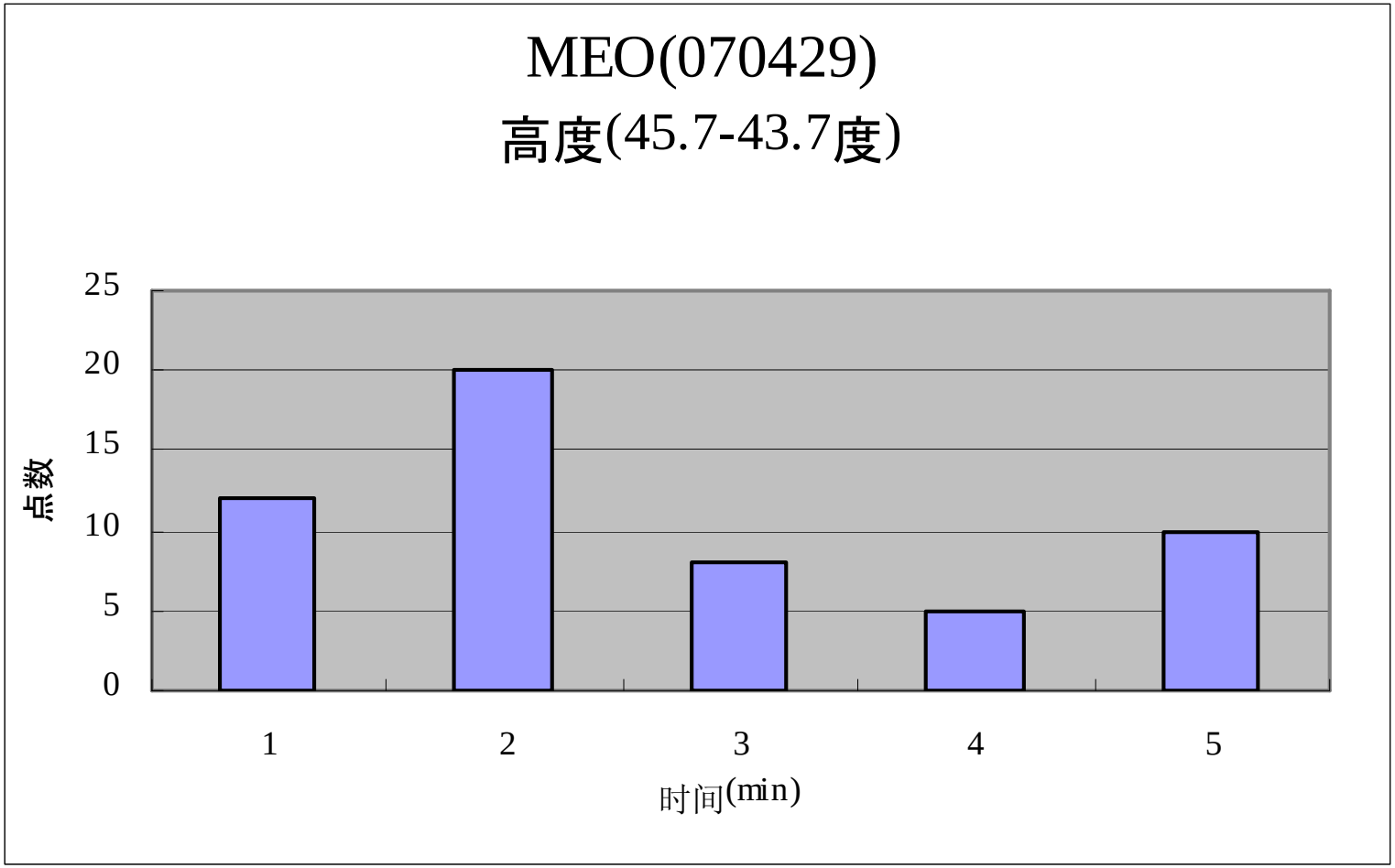
# Conclusions

- The performance of the Compass M1 LRA is excellent
- The uncoated corner cubes are fine for high orbit satellites

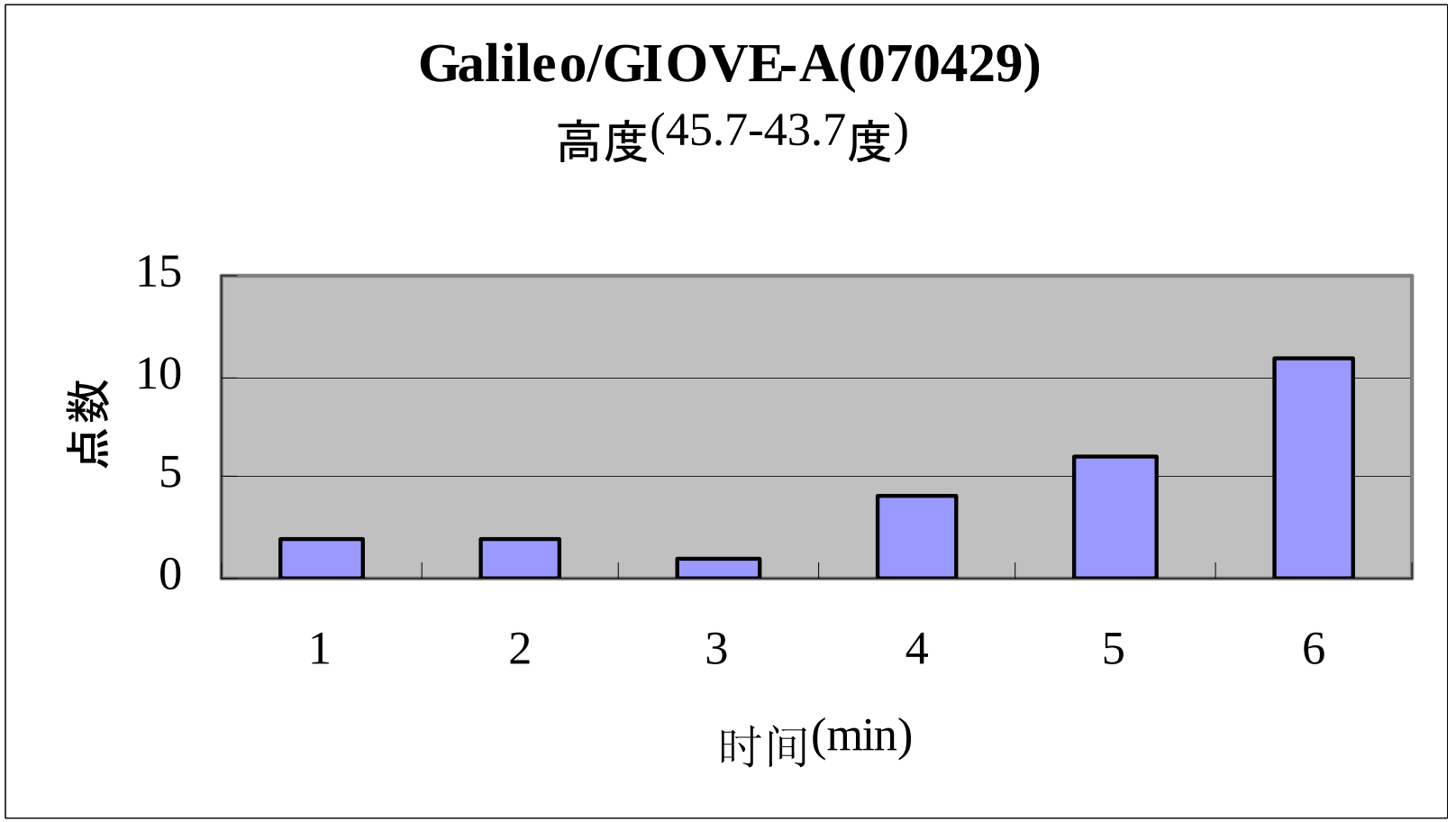
# Thank you




**MEO试验星的实测回波统计(全弧段)**




**MEO试验星的实测回波统计**
**（12个回波/分钟）**




**Galileo/GIOVE-A 试验星的实测回波统计**
**（4个回波/分钟）**

# Abstract

The Chinese experimental navigation satellite《CompassM1》with an orbital altitude of 21500km was launched on April 13, 2007.

The performance of the LRA on Compass M1 and the laser ranging experiment at the Changchun SLR station are introduced.

It is shown in the experiment that the returned signal strength from the LRA is much stronger than the signals from GPS-35/36 and GIOVE-A.