System Improvement and GIOVE-A Observation of Changchun SLR

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1. Project background

- Galileo Navigation Constellation needs Laser Ranging data
- Choose a present SLR station in China to offer the service in order to meet the need of Galileo mission as soon as possible
- Cooperation of North China Research Institute of Electro-Optics (CGI) and changchun observatory of national astronomical observatories of CAS

2. Contents of SLR improvements

- **Telescope :**
  Primary mirror and second mirror of the receiving telescope must be recoated, tested, adjusted and calibrated. This will result in higher transparency of the receiving optics.

- **Encoder**
  A new-type photoelectric encoder will be installed in the tracking mount to replace the old one. This will improve the resolution of the angular sensor of the tracking mount.

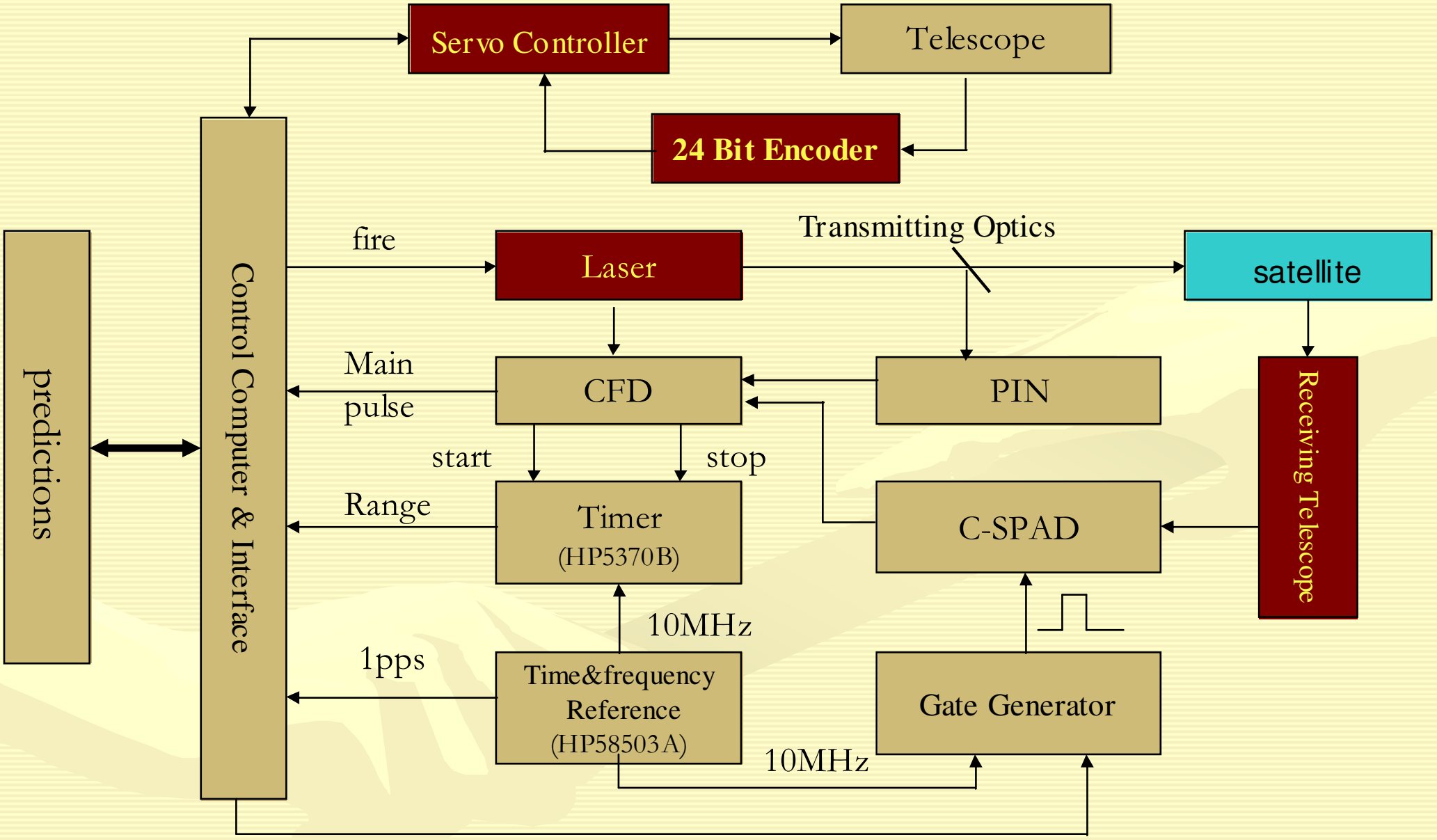
- **Servo System**

  An new type of servo driver will be used to improve the telescope tracking performance. This will heighten the tracking precision

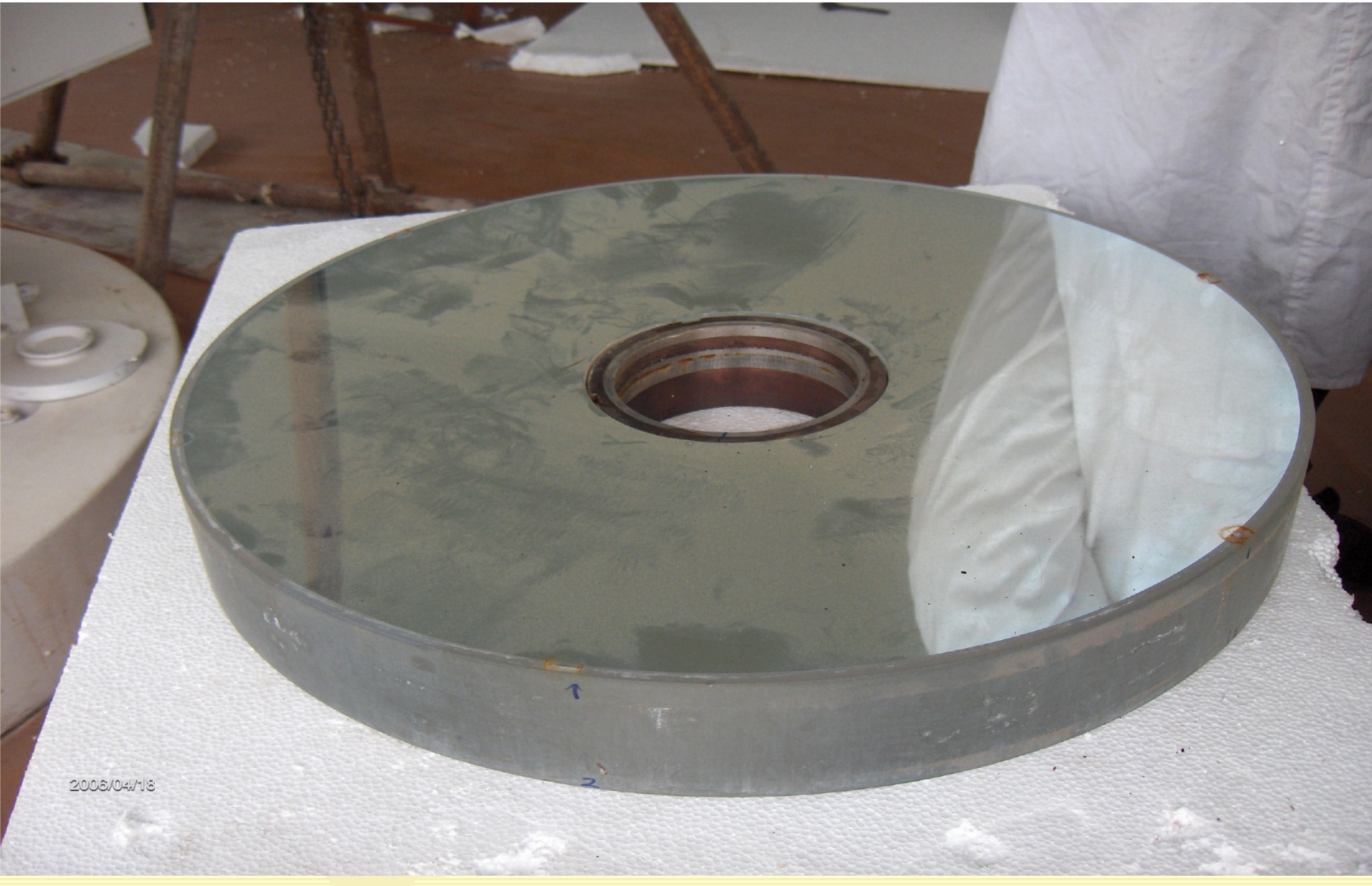
- **Laser System**

  The old laser components will be replaced in order to heighten the laser output energy up to 70-100mj and improve output stability. This will greatly increase the number of photons reflected back from the satellites.

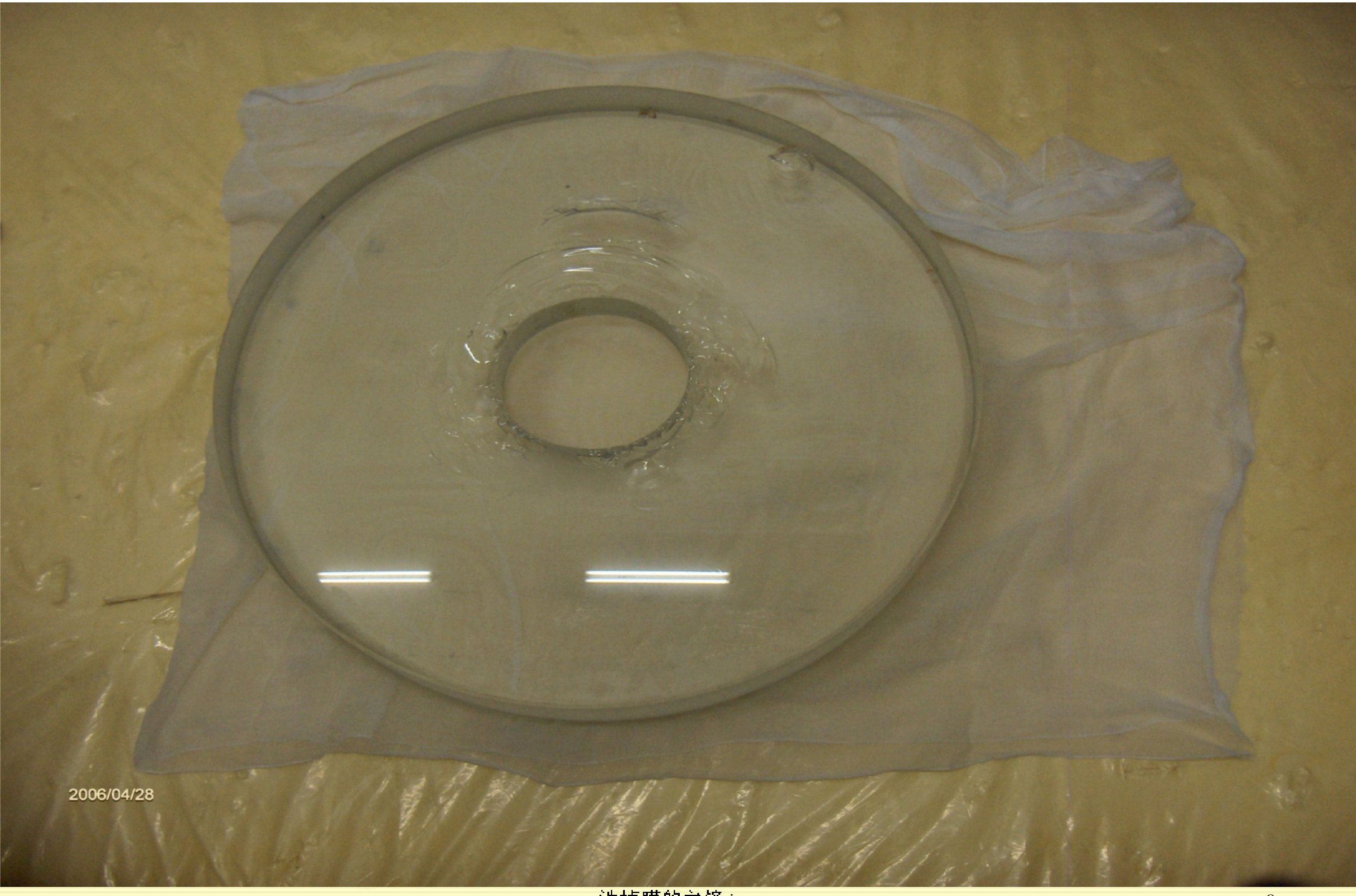
Changchun SLR System Model



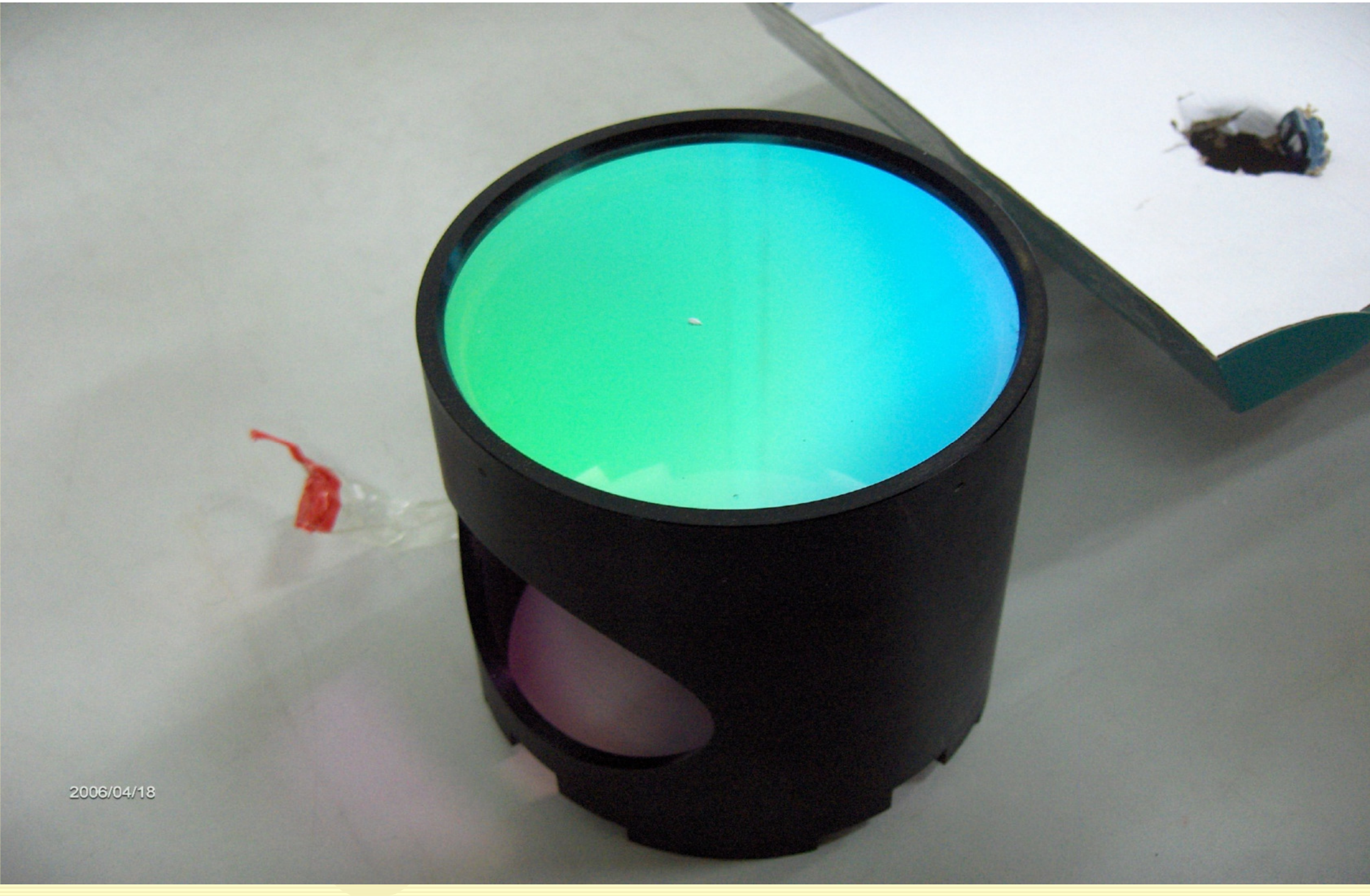
经纬仪拆卸前.jpg

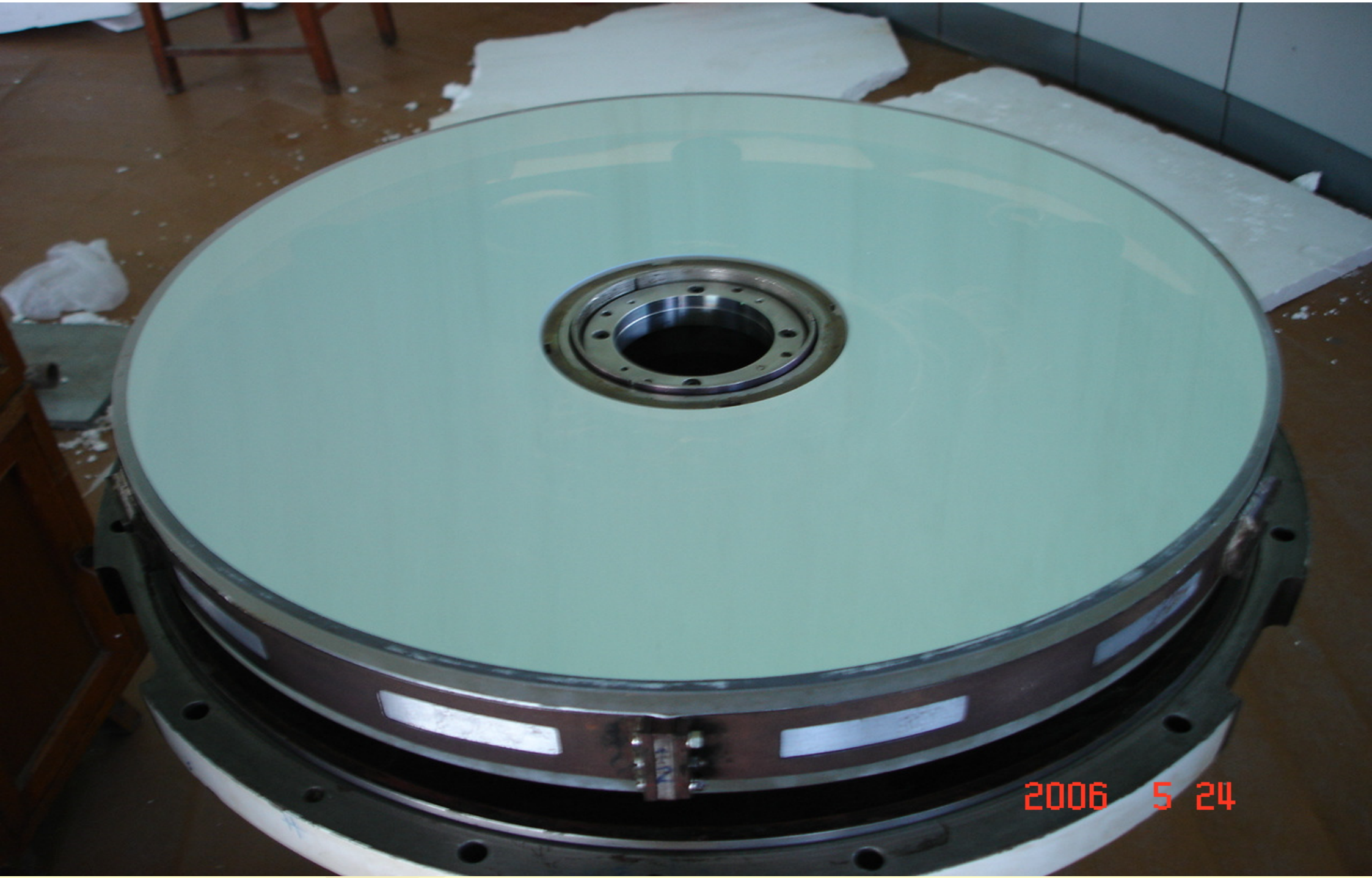


拆下来的主镜.jpg

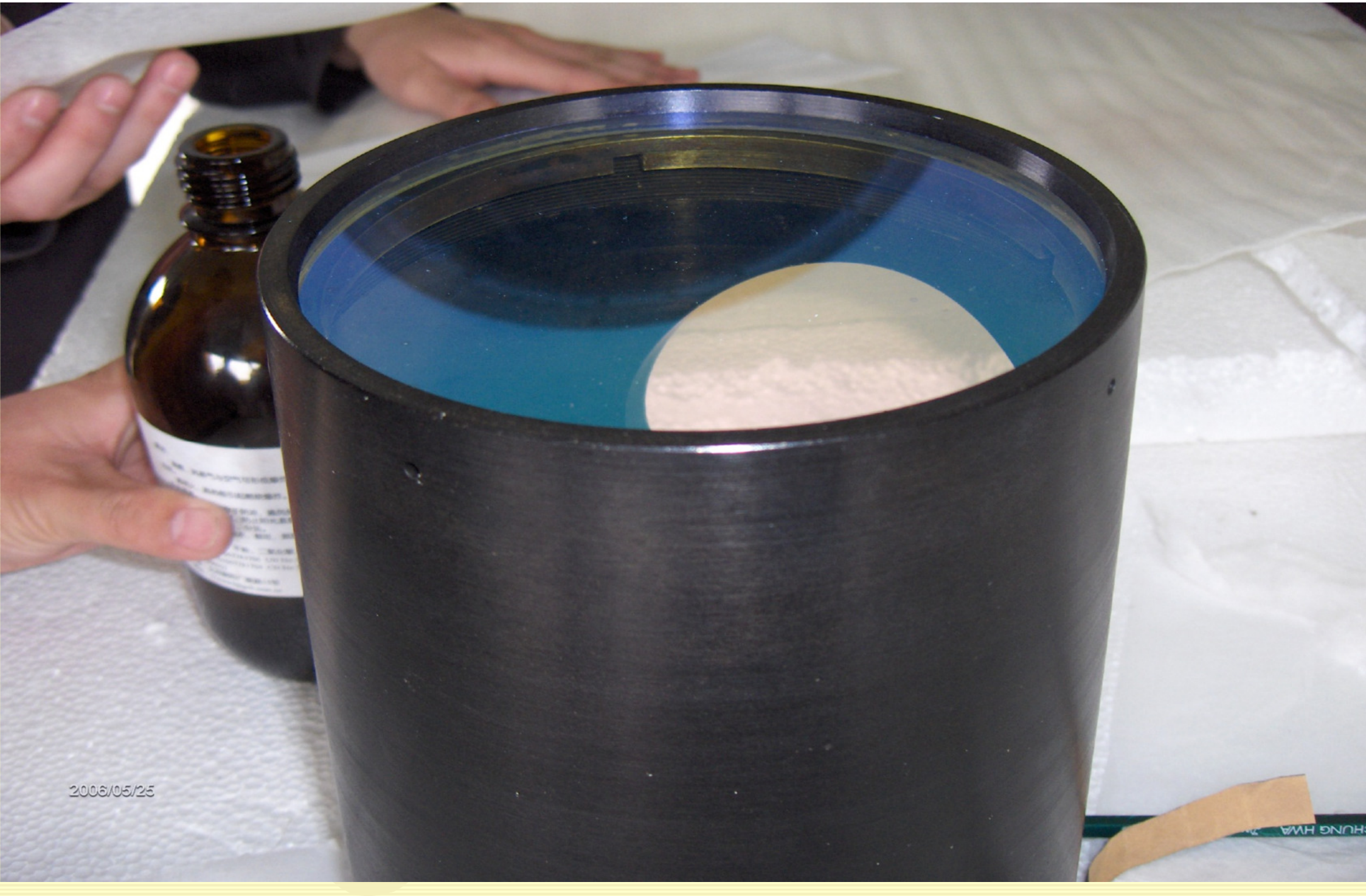


洗掉膜的主镜.jpg


2006/04/18



镀膜后的主镜.JPG



镀膜后的新弯月镜

镀膜后的副镜安装完成.jpg

- **After recoated, the reflectivity and transparency of the mirrors for 532nm**

  primary mirror: 97.29%

  second mirror: 99.049%

  dichroic mirror: 99.55%

  45° reflector: 99.83%

To meet the specification, and the requirement of reflectivity and transparency of visible light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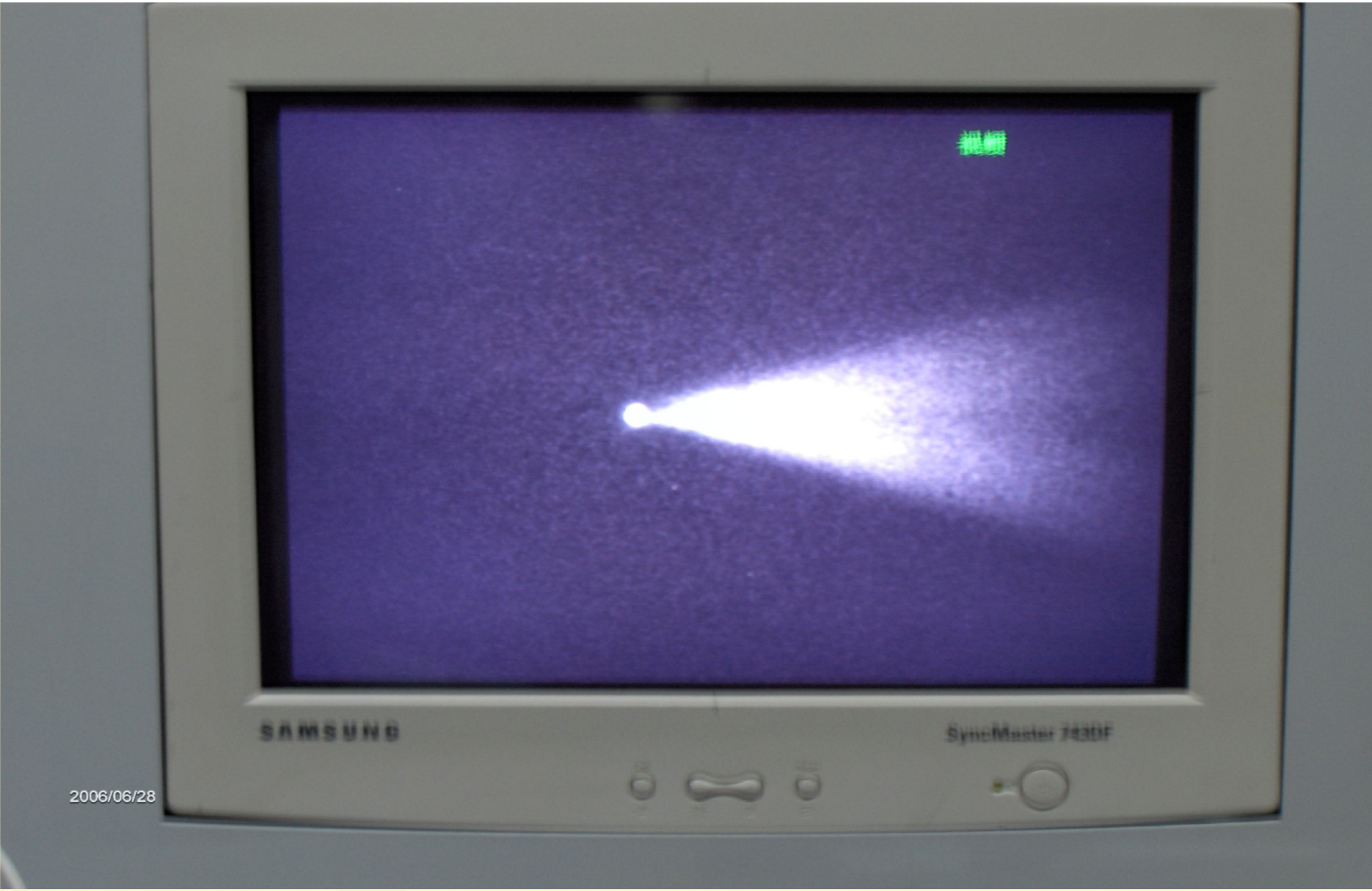
24 位 绝 对 式 编 码 器
A:039° 12' 58"
E:044° 26' 38"
清 零
高低 方位
外采
内采
电 源
2006/09/26



监视器上看到的激光.jpg

3. Performance after improvement

- **Tracking speed and stability greatly improved**

  satellite changed
- **Output laser increased**

  30mj --- 80mj
- **Ranging ability increased**

  points from high satellite
- **passes increased**

- Jan.1---Oct.12,2006
  - total passes:2581
- June 1---Oct.12,2006
  - 1551 passes
- 16 passes of GIOVE-A satellite
- Precision

- Acceptance Test Plan has been submitted
- Each updated item was tested
- Preliminary tracking tests have been carried out

Thanks !