南京邮电大学
Nanjing University of Post & Telecom

物理实验教学中心

Physics Expeiment Center

Spectrometer

Li Bin

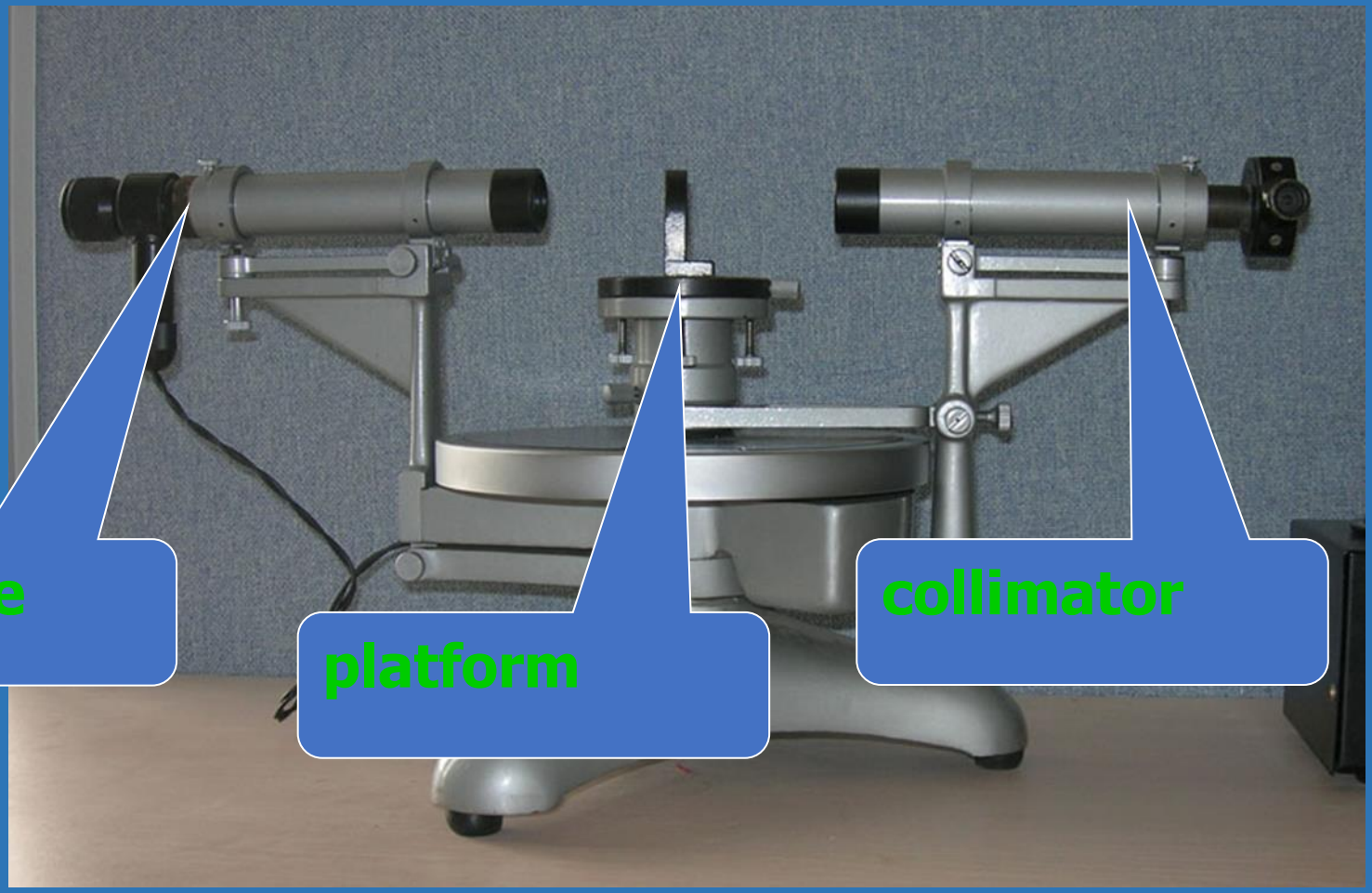
NJUPT

Experimental purposes

1、The structure and adjustment of spectrometer.

2、The measurement of the vertex angle of prism.

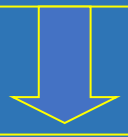
Instruments



Adjustments of spectrometer

Make the telescope focused at infinity

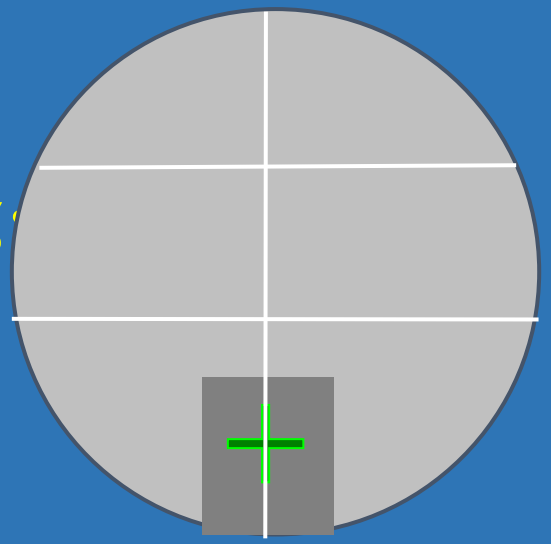
Make the axis of telescope & platform are perpendicular to the center axis



Make the axis of collimator are perpendicular to the center axis

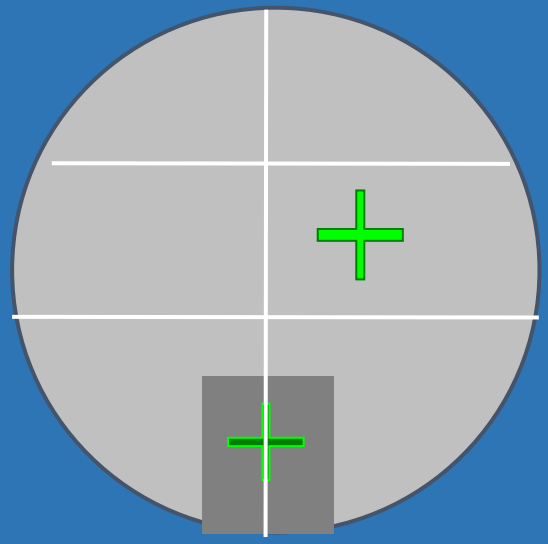
Telescope

❖**Eyepiece (eye lens) focusing:**



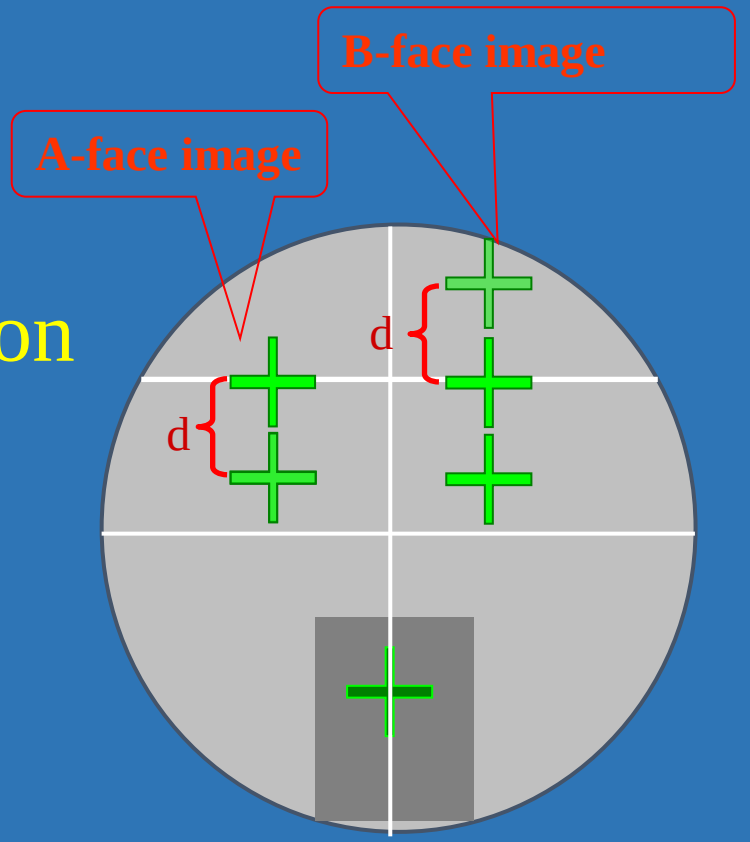
❖**Objective lens focusing:**

Make the double-faced mirror attached to the objective lens, move the eyepiece sleeve, then tighten the locking screw.

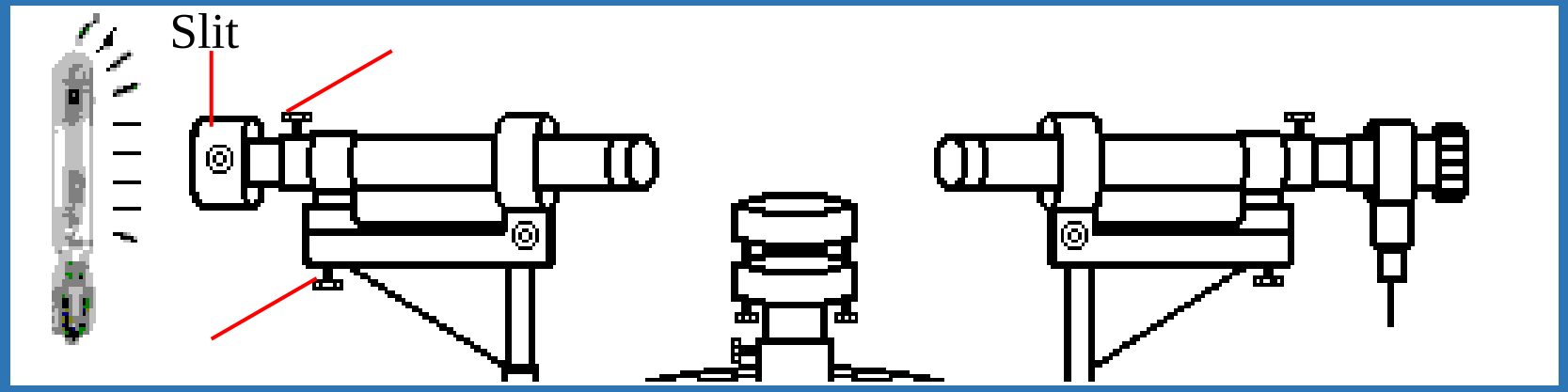


Vertical adjustment

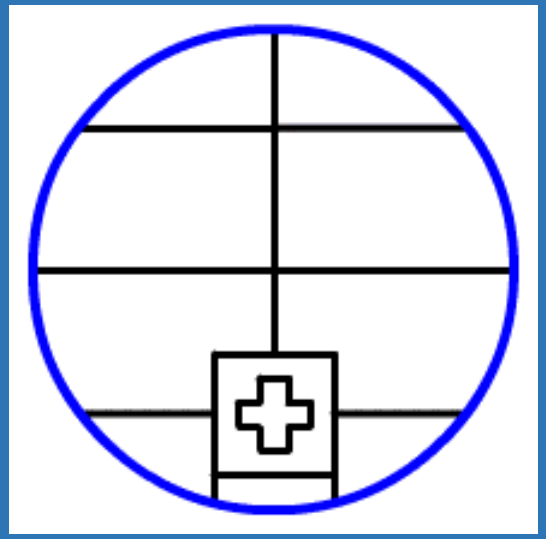
- Final vision: see right
- Method:
  - Three adjusting screw button under the loading platform
  - The telescope elevation adjusting screw
- Steps:
  - Coarse adjustment
  - Fine adjustment



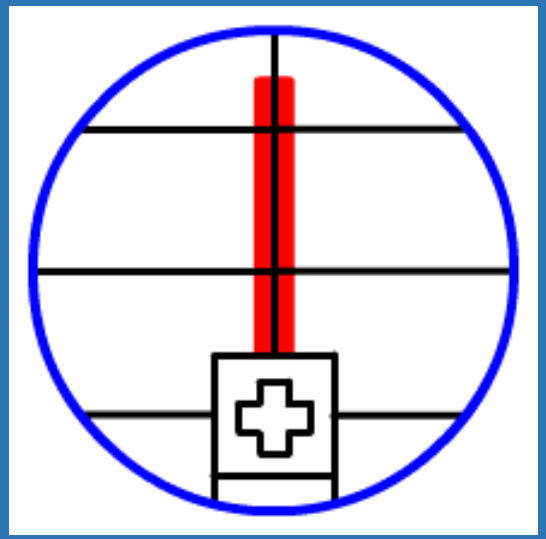
collimator



①

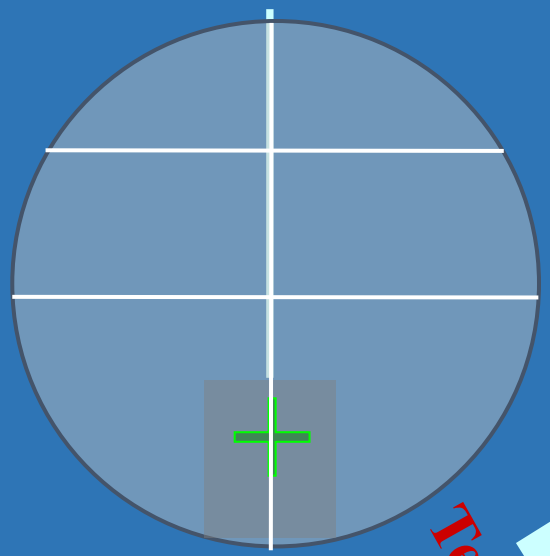


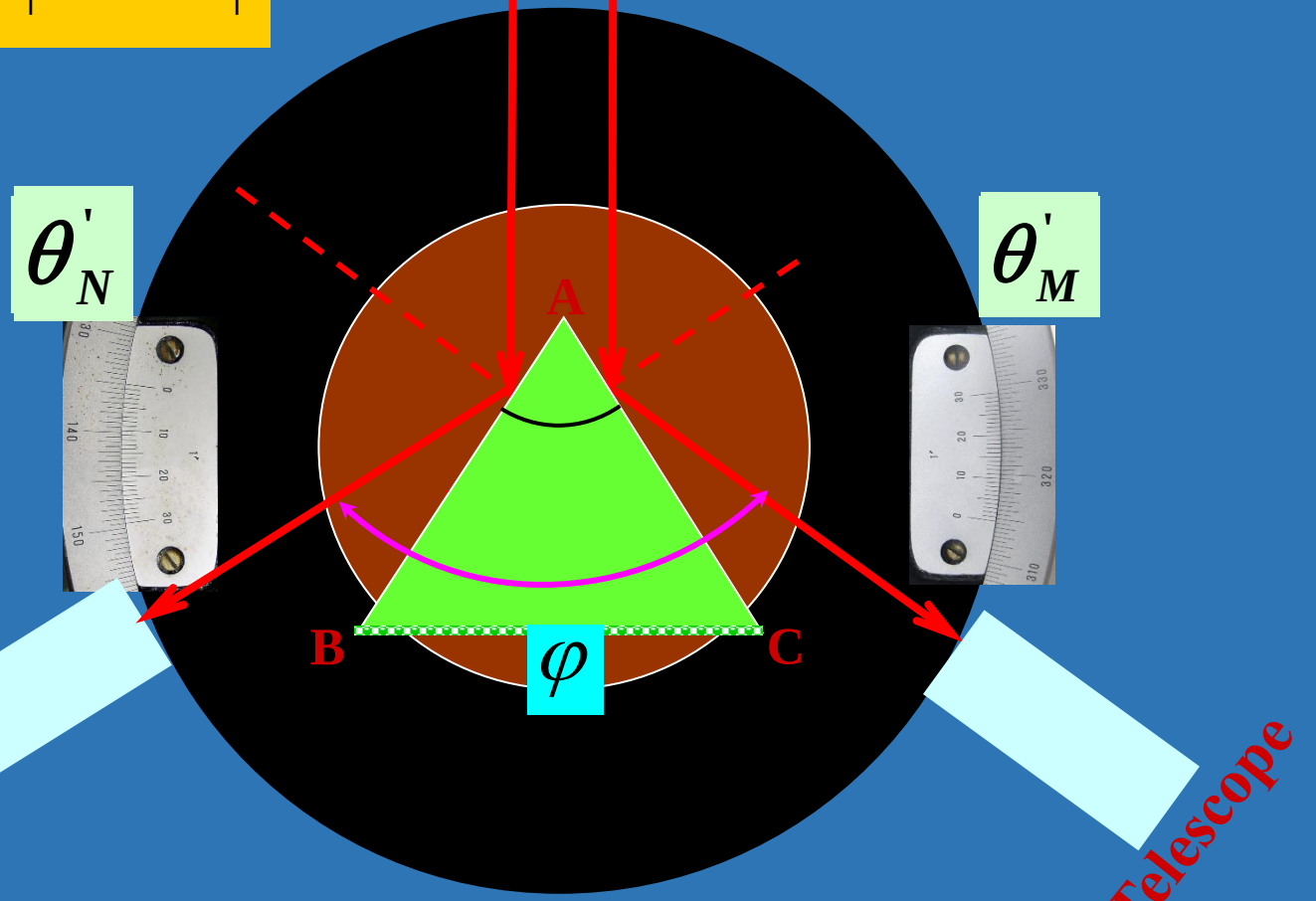
②



Measure the vertex angle

$$A = \frac{\varphi}{2} = \frac{1}{4}[\left|\theta_M^{'} - \theta_M\right| + \left|\theta_N^{'} - \theta_N\right|]$$





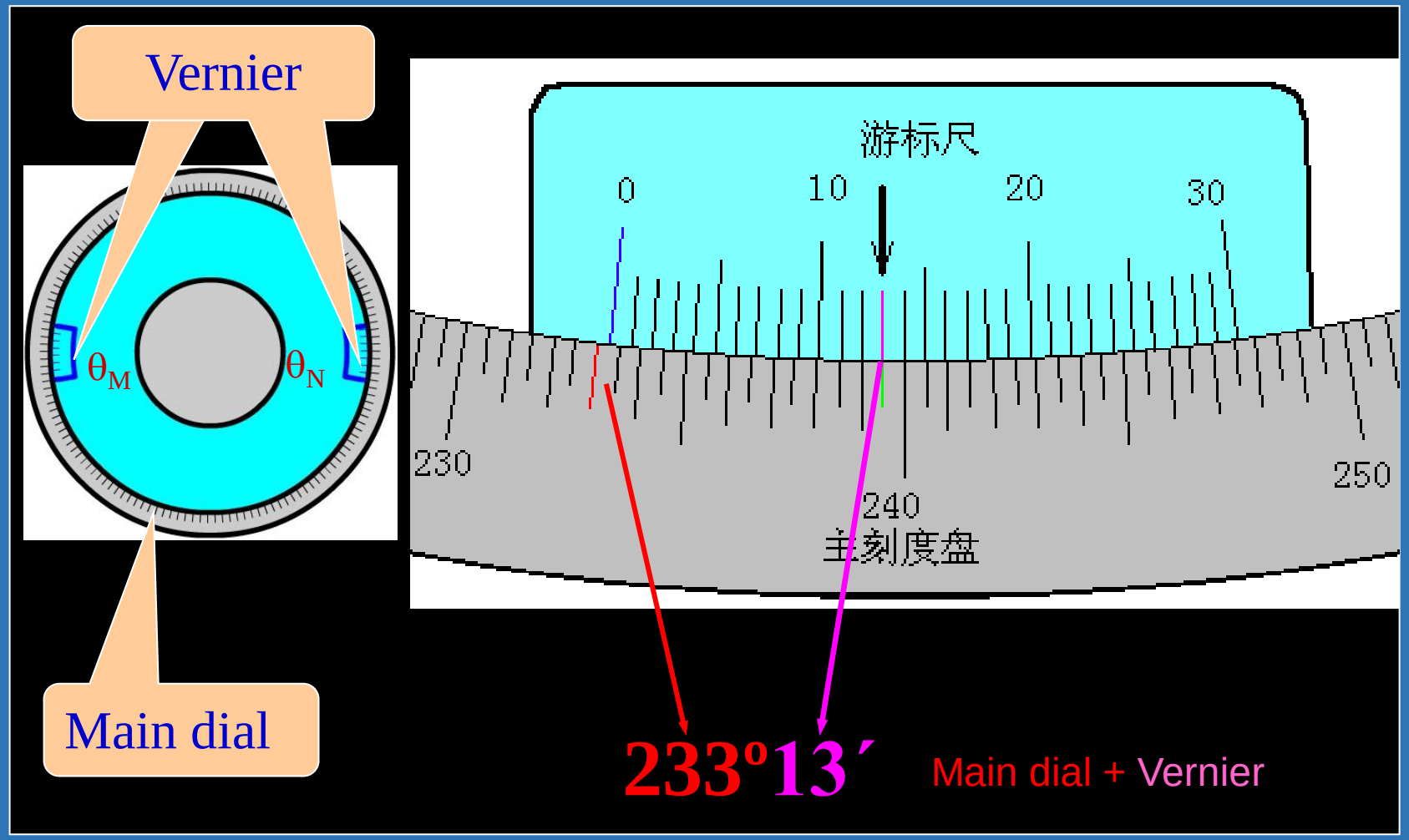
Calculate the vertex angle :

$$A = \frac{1}{4}(|\theta'_M - \theta_M| + |\theta'_N - \theta_N|)$$

We need to measure four angles:

θ_M θ_M' θ_N θ_N'

Reading system



Data

➢Table

Angle / NO.	θ_M	θ_N	θ_M'	θ_N'	$\lvert\theta_M - \theta_M'\rvert$	$\lvert\theta_N - \theta_N'\rvert$	$A=[\lvert\theta_M - \theta_M'\rvert+\lvert\theta_N - \theta_N'\rvert]/4$	Average value $\bar{A}$
1	319°11’	139°8’	199°4’	19°4’				
2	54°39’	234°39’	174°53’	354°53’				
3	354°45’	174°44’	474°51’	294°47’				

END