南京邮电大学
Nanjing University of Post & Telecom

物理实验教学中心

Physics Expeiment Center

Wheatstone Bridge

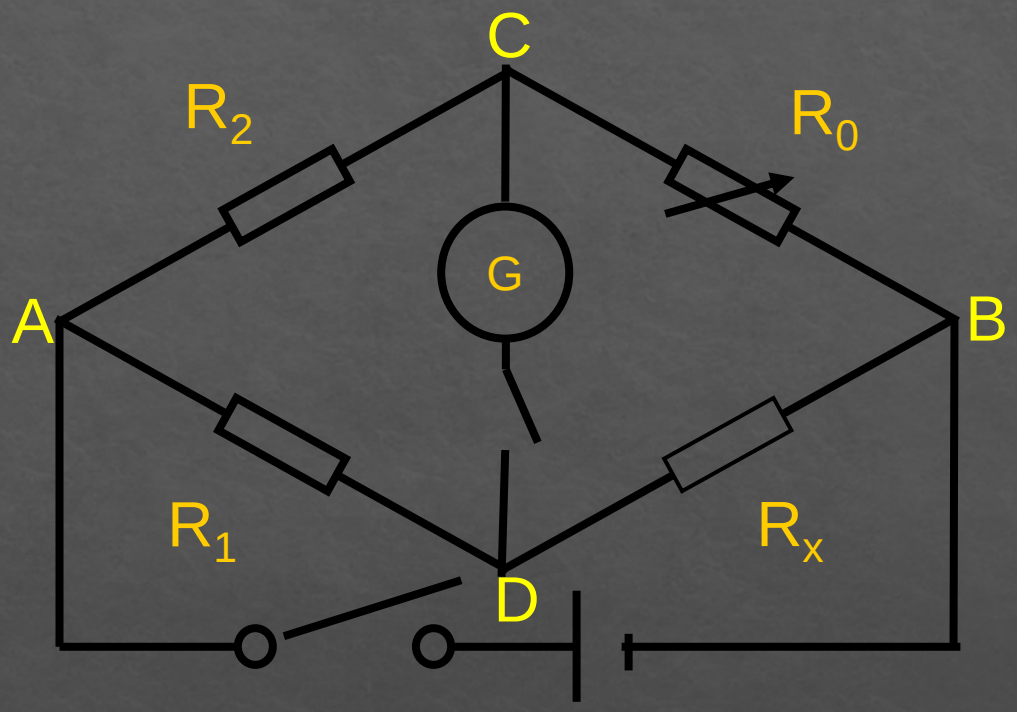
Li Bin

NJUPT

I. Purposes

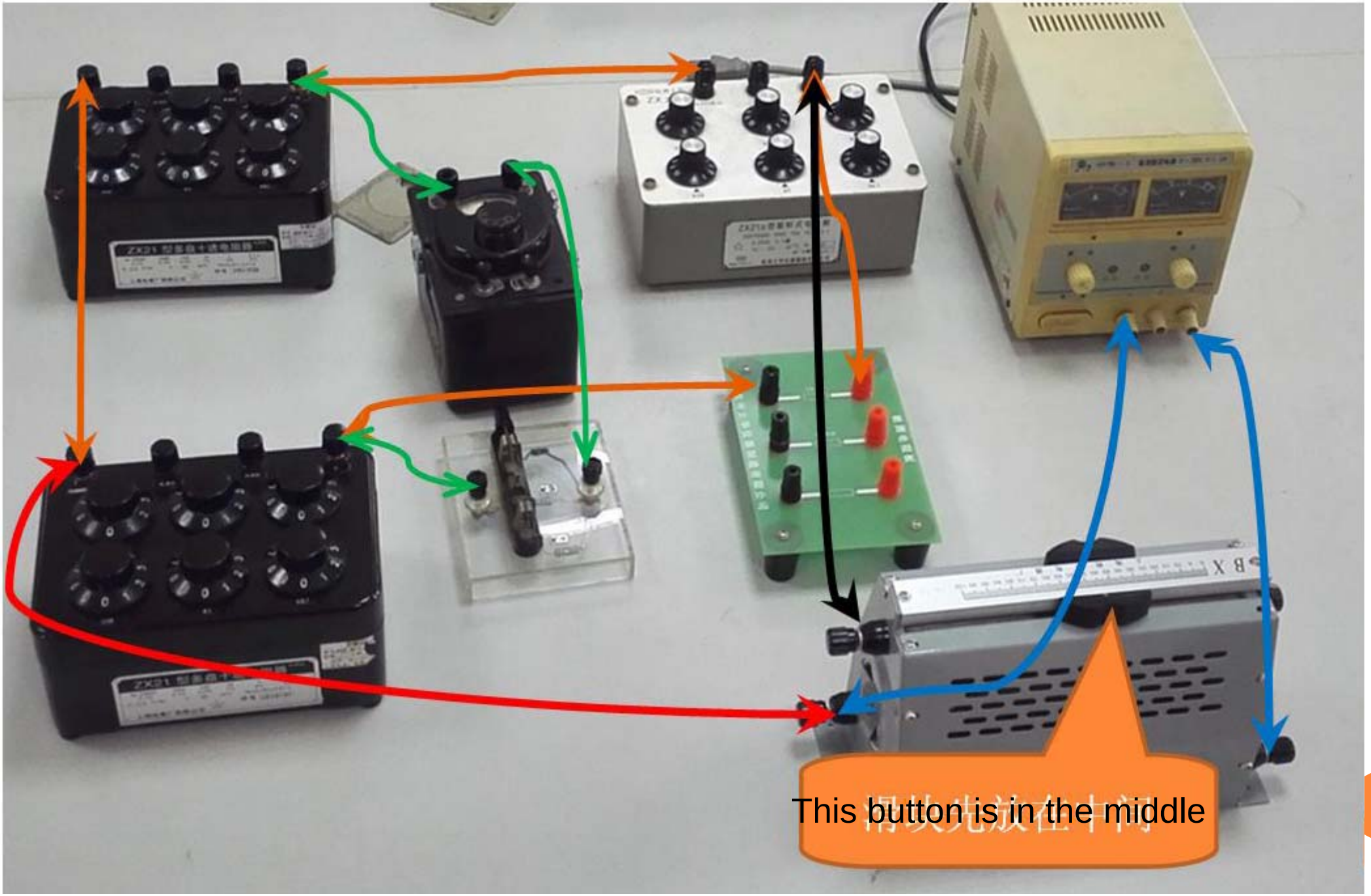
1. Know the structure and measurement principles of Wheatstone Bridge.
2. Build the circuit and handle the method of measuring resistance.

II. Principles

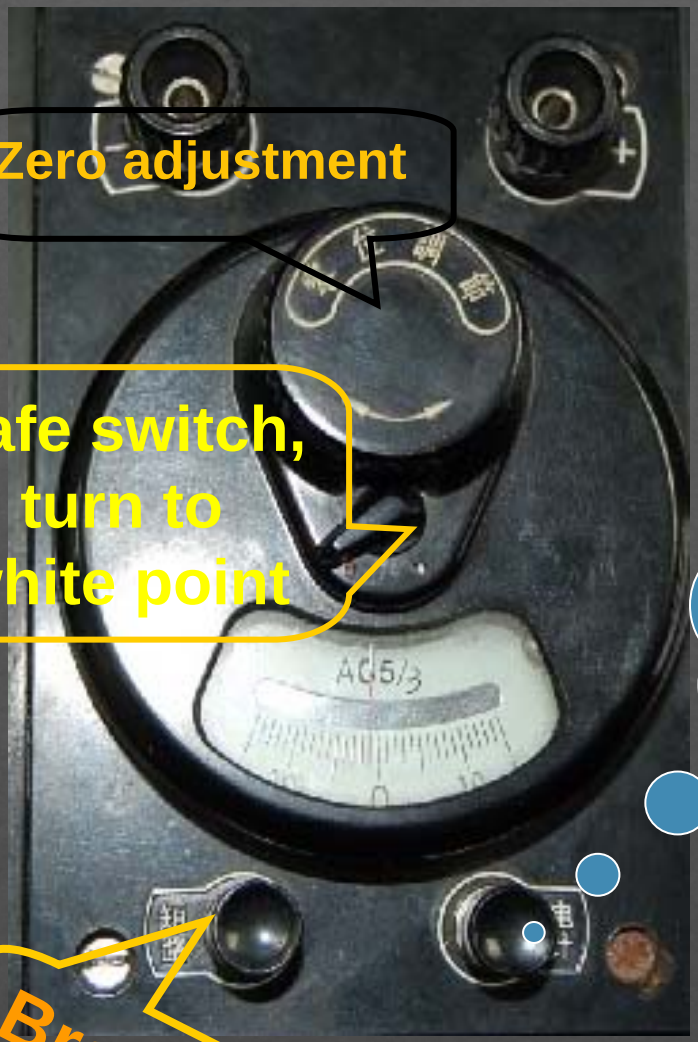


If I_G=0, $R_x = \frac{R_1}{R_2} R_0$

Bridge sensitivity: $S=\Delta n/(\Delta R_0/R_0)$


This button is in the middle

Galvanometer



Switch on

Source

III. Contents and Steps

1. Connect the circuit;
2. Initialize the instruments, Set the ratio： R_1/R_2,

Rx1 ~ 30 Ω → $R_1 : R_2 = 100.0 : 1000.0$ and $100.0 : 2000.0$

Rx2 ~ 1500 Ω → $R_1 : R_2 = 1000.0 : 1000.0$ and $1000.0 : 2000.0$

3. Coarse adjustment: open switch S_g, adjust R_0 to make $I_g=0$;
4. Fine adjustment: close S_g, adjust R_0 again to make $I_g=0$;
5. Bridge sensitivity measurement: after $I_g=0$,continue to change R_0, let the indicator deviate from the equilibrium position five grids ($\Delta n=5$), record the new value of R_0 and calculate ΔR_0;
6. Change R_1/R_2, repeat step 3-5.

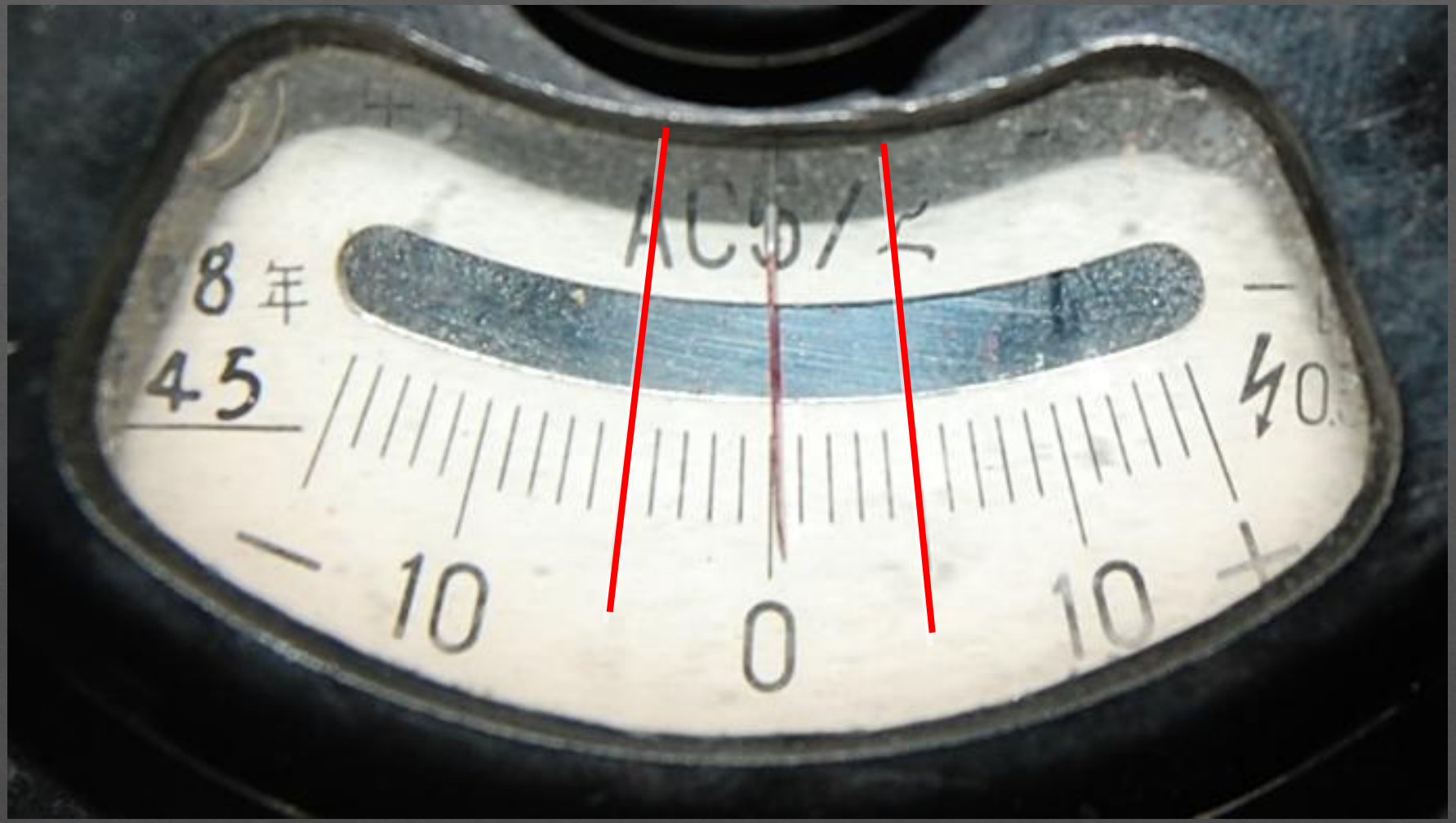

8年
45
ACV
10
0
10

Table I

No. / R	R_1/Ω	R_2/Ω	R_0/Ω	R_{x1}/Ω	$\Delta R_0/\Omega$
1	100	1000			
2	100	2000			

Table II

No. / R	R_1/Ω	R_2/Ω	R_0/Ω	R_{x2}/Ω	$\Delta R_0/\Omega$
1	1000	1000			
2	1000	2000			

END