

## 五、实验数据处理

### 实验2.三棱镜顶角的测量

#### (1)原始数据记录表格

i	1	2	3	4	5
$\alpha_1$	1°0′	1°0′	1°0′	1°0′	1°0′
$\beta_1$	1°0′	1°0′	1°0′	1°0′	1°0′
$\alpha_2$	2°0′	2°0′	2°0′	2°0′	2°0′
$\beta_2$	2°0′	2°0′	2°0′	2°0′	2°0′
$\theta$	1°0′	1°0′	1°0′	1°0′	1°0′
$A$	0°30′	0°30′	0°30′	0°30′	0°30′

$$\text{其中 } \theta = \frac{1}{2}[(\alpha_2 - \alpha_1) + (\beta_2 - \beta_1)], A = \frac{1}{2}\theta$$

#### (2)不确定度的计算

$$\bar{A} = \frac{1}{5} \sum_{i=1}^5 A_i = 0.5^\circ$$

A类误差:

$$u_a(A) = \sqrt{\frac{\sum_{i=1}^5 (A_i - \bar{A})^2}{5 \times (5 - 1)}} = 0^\circ$$

B类误差:

$$u_b(A) = \frac{\Delta_{\text{仪}}}{\sqrt{3}} = \frac{1'}{\sqrt{3}} = (9.622 \times 10^{-3})^\circ$$

不确定度:

$$u(A) = \sqrt{u_a(A)^2 + u_b(A)^2} = \sqrt{0^2 + 0.009622^2} = 0.009622^\circ$$

相对不确定度:

$$\frac{u(A)}{A} = 0.019244$$

最终结果为:

$$A \pm u(A) = (0.5 \pm 0.01)^\circ$$