

2. 对某段距离进行5次同精度丈量, 观测值分别是 148.062, 148.058, 148.063, 148.062, 148.060 (单位为m)。试求这段距离的最或然值、观测值中误差及最或然值中误差。

解: 最或然值即为平均值: $\bar{x} = \frac{\sum_{i=1}^n x_i}{n} = \frac{\sum_{i=1}^5 x_i}{5}$

$$= \frac{148.062 + 148.058 + 148.063 + 148.062 + 148.060}{5} = 148.061 \text{ (m)}$$

$$\sigma = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}} = \sqrt{\frac{\sum_{i=1}^5 (x_i - \bar{x})^2}{4}} = 2 \text{ (mm)}$$