

Olteanu Iulia, 314 CC

$$l = 7 \cdot 10 + 25 = 95 \text{ cm} = 0,95 \text{ m}$$

Număr măsurători	$10 T(n)$	$T(n)$
1	19,48	1,948
2	19,42	1,942
3	19,50	1,950
4	19,51	1,951
5	19,53	1,953
6	19,50	1,950
7	19,41	1,941
8	19,51	1,951
9	19,39	1,939
10	19,38	1,938

$$\bar{T} = \frac{1}{N} \sum_{i=1}^N T_i$$

$$N=10 \Rightarrow \bar{T} = \frac{1}{10} \sum_{i=1}^{10} T_i = \frac{19,463}{10} = 1,9463$$

$$\bar{g} = \left( \frac{2\pi}{\bar{T}} \right)^2 l = 3,2266 \cdot 0,95 = 10,4109 \cdot 0,95 = 9,890355 \text{ m/s}^2$$

$$\bar{g} = 9,890335 \text{ m/s}^2 > 9,806 \text{ m/s}^2$$

$$\sigma_{\bar{T}} = \frac{\sigma_T}{\sqrt{10}}$$

$$\sigma_T = \sqrt{\frac{(T_1 - \bar{T})^2 + (T_2 - \bar{T})^2 + \dots + (T_{10} - \bar{T})^2}{10 - 1}}$$

$$= \frac{1}{9} \sqrt{(0,0017)^2 + (-0,0043)^2 + (0,0037)^2 + (0,0044)^2 + (0,0067)^2 + (0,0037)^2 +$$

$$+ (-0,0053)^2 + (0,0044)^2 + (-0,0043)^2 + (-0,0083)^2} =$$

$$= \frac{1}{9} \sqrt{0,00028805} = \frac{0,0169}{3} = 0,00563$$

$$T_{\alpha} \in (\bar{T} - \sigma_{\bar{T}}, \bar{T} + \sigma_{\bar{T}}); T_{\alpha} \in (\bar{T} - 2\sigma_{\bar{T}}, \bar{T} + 2\sigma_{\bar{T}}); T_{\alpha} \in (\bar{T} - 3\sigma_{\bar{T}}, \bar{T} + 3\sigma_{\bar{T}})$$

$$\sigma_{\bar{T}} = \frac{\sigma_T}{\sqrt{10}} = \frac{0,00563}{3,16227} = 0,00178$$

$$\Rightarrow T_{\alpha} \in (1,94452; 1,94803) \text{ (probabilitate } 68\%)$$

$$T_{\alpha} \in (1,94274; 1,94986) \text{ (probabilitate } 95\%)$$

$$T_{\alpha} \in (1,94096; 1,95164) \text{ (probabilitate } 99,7\%)$$