

Comparison of the calculated temperature from the COMPTON-Wavelength of the electron with measured temperatures of the background radiation (July 2024)

In the part „background radiation“ of this homepage the calculation of the temperature of the cosmic background radiation is declared, among others from the COMPTON-Wavelength of the electron. A value of 2.7249026... K was obtained. The number of numerals following the decimal point does not mean the precision. No analysis was carried out of the uncertainties of the resulting values based on the uncertainties of the used natural constants and other calculated numerical values.

For comparison with measured temperature values data from Table 2 in /1/ was used.

The comparison is shown in Fig. 1 and for a part of measured values in Fig. 2 with more precision.

(Note: Because of the use of the German Excel version, for example is: 2,72548 K=2.72548 K.)

Comparison:

1. According to /1/ the majority part of all enumerated measurements is represented from FIRAS-measurements. They are to see in Fig. 2 as positions 1, 2 and 3. The calculated value (Position 5) from the COMPTON-Wavelength is located within the uncertainties of all three positions.
2. According to /1/ result from a combination of measured temperatures the value 2.72548 +/- 0.00057 K. This value is shown in Fig. 2 as position 4. The calculated value from COMPTON-Wavelength of the electron (Position 5) is only very little out of the uncertainty.

References: /1/ D.J. Fixsen „THE TEMPERATURE OF THE COSMIC MICROWAVE BACKGROUND“, The Astrophysical Journal, 707:919, 2009 December 20

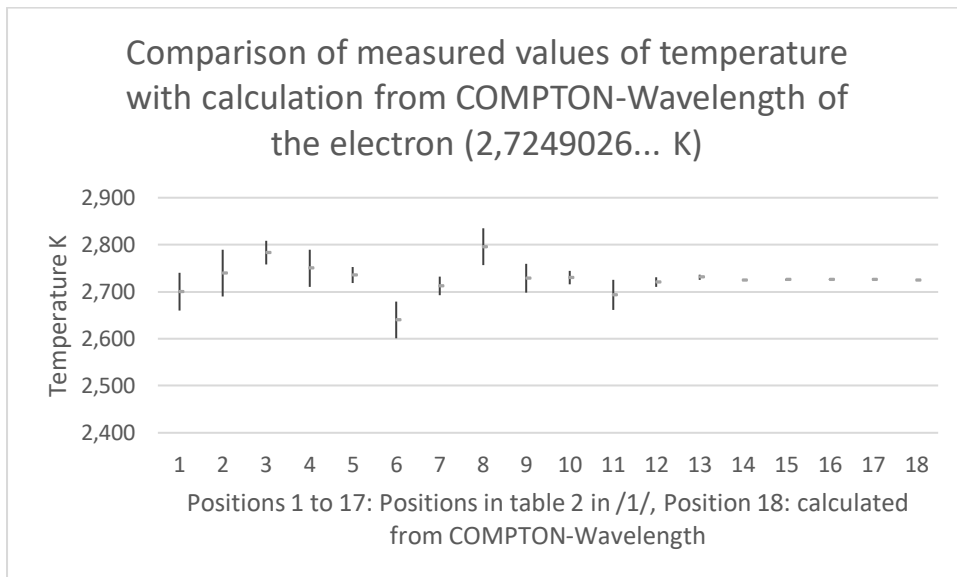


Fig. 1 Comparison of measured values of temperature with calculation from COMPTON-Wavelength of the electron (Position 18)

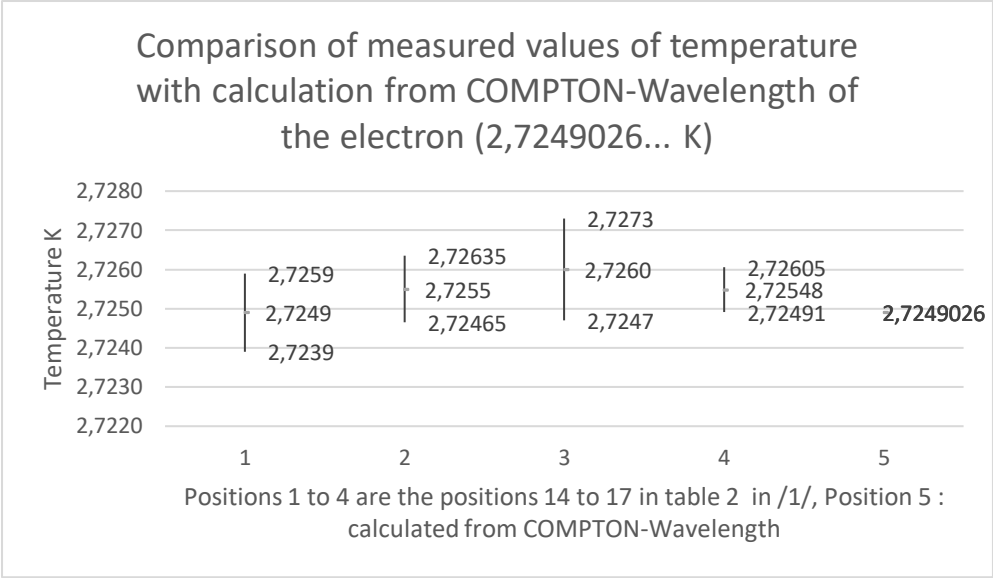


Fig. 2 Comparison of measured values of temperature with calculation from COMPTON-Wavelength of the electron (Position 5)