

# Influence of the spectral interval choice on the temperature determination accuracy by multiwave thermometry methods

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Using model examples, the analysis of the instrumental accuracy of determining the model temperatures from the measurement data of radiance temperatures for two and three experimental points is carried out, when neither the thermodynamic temperature nor the emissivity of the sighting site are known.

An estimate of the instrumental accuracy of determining the desired temperature depending on the choice of the spectral window in the thermal radiation spectrum is given.

It is shown that moving the spectral window to the long-wavelength region of the thermal radiation spectrum can worsen the instrumental accuracy of the desired temperature by several times. For two wavelengths this problem was briefly discussed in [1].

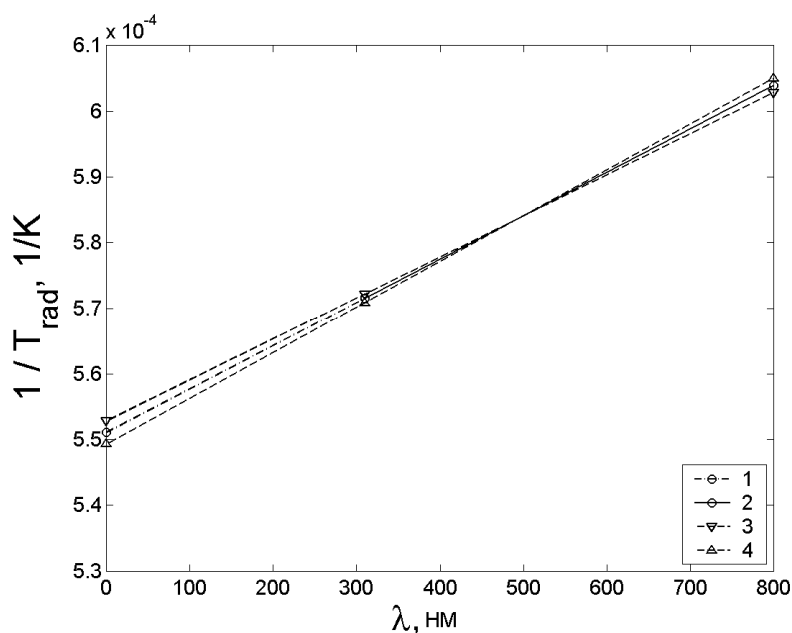


Fig. 1. Illustrative example of the influence of the uncertainty in determining the radiative temperatures on temperature  $T_c$  for the “gray” model at  $\lambda_1 = 310nm$  and  $\lambda_2 = 800nm$ .  $T_{rad,1} = 1749.6 \pm 2K$ ,  $T_{rad,2} = 1655.8 \pm 2K$ .

1 —  $T_c = 1814.7K$ ; 2 —  $T_c = 1814.7K$ ; 3 —  $T_c = 1808.9K$ ; 4 —  $T_c = 1820.5K$ .

1. Rusin S.P. *Determination of the True Temperature of Opaque Materials by the Thermal Radiation Spectrum. Computer Modeling*. Moscow: URSS, 2021. 160 c.