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On the Interpretation of Remote Sensing Information Obtained as a Result of Multi-Zone Surveying in the Infrared Range as a Temperature of Radiation

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Abstract. The paper analyzes the terms that exist and are used in Russian practice, that allow to put in correspondence with infrared radiation a certain temperature of the emitter. The limits of applicability of the terms "radiation temperature" and "brightness temperature", which are currently used to interpret the Earth's remote sensing data in the infrared range, are analyzed. The imperfection of the terminology in relation to the information obtained as a result of multi-zone survey is revealed. It is proposed to introduce the terms "effective radiation temperature", "effective brightness temperature" and "effective wavelength" into use in Russian practice. The limits of applicability of the proposed terms are indicated, formulas for their definition are given. On the example of model and real functions of the spectral sensitivity of the bands, the analysis of the admissibility of interpreting the data obtained in them as an effective brightness temperature is carried out. The dependence of the methodological error arising from such an interpretation on the wavelength and the range of measured temperatures is analyzed. It is shown that it is preferable to interpret the data of multi-zone survey in the infrared range as the effective radiation temperature.

Keywords: infrared range, radiation temperature, brightness temperature, effective radiation temperature, effective brightness temperature, effective wavelength

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