

SOME ASPECTS OF PYROMETRY OF "WHITE" OBJECTS

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Model surface temperature up to 2000–2500 °C should be measured in thermal wind tunnels. The basic method of surface temperature distribution measurement is the brightness pyrometry. Brightness pyrometers measure the brightness temperature, and it is necessary to know the emissivity of the object material to recalculate brightness temperature to the real surface temperature.

Models of blunted cones made of ceramic materials were investigated in the wind tunnel with electric arc heater. These materials are white and this fact determined the problems of brightness pyrometry application for surface temperature measurement of such models. Spectral pyrometry method allows to determine the surface temperature of gray bodies without information about their emissivity. Absolute calibration of spectrometer allows to measure the brightness temperature also. Knowledge of the brightness and spectral temperatures allows to determine the emissivity of the body.

Another advantage of spectral pyrometry is the possibility to measure model emissivity during the experiment in one selected point. The results of emissivity measurements during the experiment can be used in processing of the results of panoramic brightness pyrometer measurements and it will increase the accuracy of temperature measurement.

Keywords: pyrometry, brightness temperature, spectral temperature, CCD array, spectral emissivity.