

ON APPLICATION OF TRANSIENT GRATING TECHNIQUE FOR INVESTIGATION OF NON-FOURIER HEAT CONDUCTION

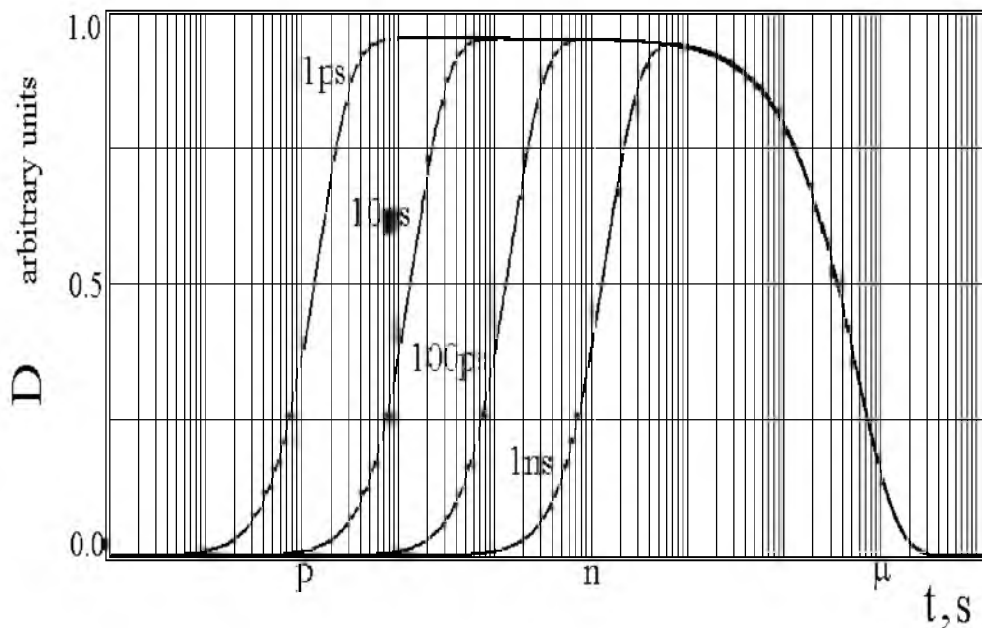
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The paradox of infinite velocity of heat propagation accordingly with Fourier heat conduction law attracts attention of science community due to the fact that extreme spatial and temporal heat flux localisation has been frequently realised in practice.

In this report theoretical results are represented on application of pulsed transient gratings method for effects of confined velocity of heat propagation study in particular for direct measurement of thermal relaxation constant τ as being the time interval for local thermal equilibrium settling in substance. Typical time behaviour of the diffracted intensity for surface thermal grating is shown in figure. The τ values are labeled at curves.



In the models considered a shape and duration of the heating pulse as well as detecting system frequency bandwidth and noise level of different origination have been taken into account. The sensitivity of models concerning relaxation time determination has been estimated. In conclusion, the experimental conditions for non-Fourier heat transfer study have been discussed.