

TO THE MOLECULAR  
THEORY OF THE PROPAGATION  
OF HIGH-FREQUENCY HEAT  
WAVES IN MAGNETIC FLUIDS

*S. Odinaev, K. Komilov*

Tajik State National University, Dyushambe, Tajikistan  
(17, Rudaki Prosp., Dyushambe 734025, Tajikistan;  
e-mail: k.komilov@mail.ru)

S u m m a r y

On the basis of molecular-kinetic theory, we study the frequency dependences of the velocity and the absorption of heat waves under the action of an inhomogeneous magnetic field. We deduced the dynamical expressions for the velocity and the absorption coefficient of heat waves. Their asymptotic behavior at low and high frequencies is studied with regard for the contribution of a structural relaxation. We performed a numerical study by the example of a magnetic fluid on the basis of kerosene and solid particles of magnetite  $\text{Fe}_3\text{O}_4$ . The results of numerical calculations are in a satisfactory agreement with the theoretical results for simple fluids.