

ENERGY EXCHANGE IN VORTEX TUBE

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The vortex tube operation is considered. The effect of separation of the peripheral and axial layers of gas at full temperature due to the exchange of work and heat between them is studied. The mechanism of kinetic energy transfer from the axis of the periphery is determined. The effect of viscosity forces and the gradient of angular velocities on the energy exchange in a vortex tube is verified. There is experimentally found dependence on the thermophysical properties of energy gas, a gas pressure value at the inlet of the vortex tube and exit valve and diaphragm geometric parameters of the main elements of the vortex tube. There is conducted research to identify the nature of the vortex effect — of the fibers of the gas temperature. The question of the development of the theory of real phenomena (Ranque effect) is considered. It is shown that the main work of the authors of this article can be regarded as the theory of the Ranque effect.

Keywords: energy domain, Rank effect, viscosity, gradient of angular velocities, mechanism of energy transfer from axis to periphery.

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For citations

Kuznetsov V. I., Makarov V. V., Shander A. Yu., Agarin M. Yu., Kuzmenko I. A. Energy exchange in vortex tube // Omsk Scientific Bulletin. Series Aviation-Rocket and Power Engineering. 2020. Vol. 4, no. 1. P. 74–82. DOI: 10.25206/2588-0373-2020-4-1-74-82.

Received January 20, 2020.

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