Statistical mechanics of Rotating Gas

I.M. Dubrovskiy

Institute for Metal Physics, 36 Vernadsky Str., 03680 Kyiv, Ukraine,
E–mail: dubrovskii@voliacable.com

Statistical mechanics for an ideal gas that is in equilibrium with rotating cylindrical envelope is formulated. An average angular velocity of the gas is introduced. The equilibrium conditions are the equalities of the temperature and the angular velocity of the gas and the envelope. The free energy of gas is obtained in classical mechanics from the Gibbs distribution. The thermodynamical potential for the non-degenerate gas is computed in quantum mechanics. They are functions of the temperature, the angular velocity, the height and the sectional area of cylinder.