

Abstract: The thesis concerns with the influence of dissipative processes in boundary layers, particularly with the influence of viscosity of the fluid and further with the influence of diffusion of water vapor in air on induction of forces acting on the flown-around bodies. Crocco's theorem implies that gradient of entropy contributes to induction of circulation, and in consequence to induction of lift. The thesis studies the generation of lift acting on the rotating cylinder; it models this situation using FEniCS software. Results are then compared with model of potential flow and with visualization of the experiment performed by Ing. Zdeněk Trávníček and Ing. Zuzana Broučková. The thesis also studies induction of lift acting on the cylinder, which has water vapor released on its upper part.