Rabinovich / Lebedev / Mytarev

Vortex Processes and Solid Body Dynamics

The Dynamic Problems of Spacecrafts and Magnetic Levitation Systems

. a wise man knows all things in a manner in which this is possible, not, however, knowing them individually. Aristotle. Metaphysics * The problem of consideration of vortex fields' influence on solid body dynamics has a long history. One constantly comes upon it in flight dynamics of airplanes, helicopters, and other flying vehicles (FV) moving in the atmosphere, in dynamics of ships with hydrofoils, and in dynamics of rocket carriers (RC) and spacecrafts (SC) with liquid-propellant rocket engines (LPRE), that are equipped with special damping devices and other structural elements inside fluid tanks. Similar problems occur when solving problems related to attitude control and stabilization of artificial Earth satellites (AES) and spacecrafts with magnetic (electro magnetic) systems, in conducting elements of which eddy currents are induced while control of those vehicles' angular position. It is also true with special test facilities for dynamic testing of space vehicles and their systems, with modern high-speed magnetic suspension transport systems (those based on the phenomenon of 'magnetic levitation'), with generators having rotors carried in 'magnetic bearings', and so on.

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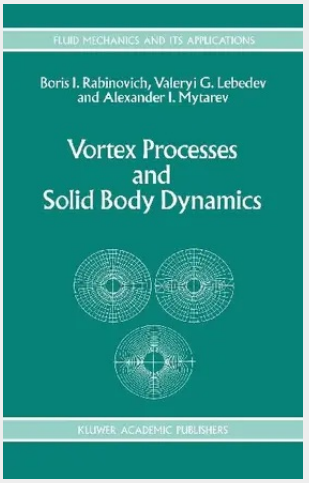

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