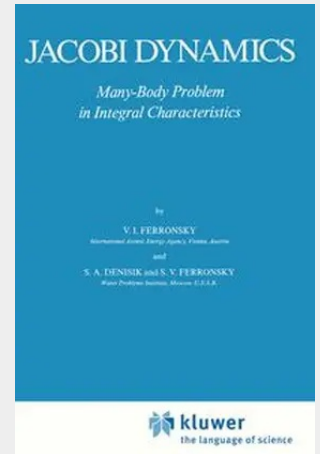


Jacobi Dynamics

Many-Body Problem in Integral Characteristics

This book sets forth and builds upon the fundamentals of the dynamics of natural systems in formulating the problem presented by Jacobi in his famous lecture series "Vorlesungen über Dynamik" (Jacobi, 1884). In the dynamics of systems described by models of discrete and continuous media, the many-body problem is usually solved in some approximation, or the behaviour of the medium is studied at each point of the space it occupies. Such an approach requires the system of equations of motion to be written in terms of space co-ordinates and velocities, in which case the requirements of an internal observer for a detailed description of the processes are satisfied. In the dynamics discussed here we study the time behaviour of the fundamental integral characteristics of the physical system, i. e. the Jacobi function (moment of inertia) and energy (potential, kinetic and total), which are functions of mass density distribution, and the structure of a system. This approach satisfies the requirements of an external observer. It is designed to solve the problem of global dynamics and the evolution of natural systems in which the motion of the system's individual elements written in space co-ordinates and velocities is of no interest. It is important to note that an integral approach is made to internal and external interactions of a system which results in radiation and absorption of energy. This effect constitutes the basic physical content of global dynamics and the evolution of natural systems.

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