

An introduction to classical perturbation theory

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1 Abstract

The notion of canonical integrability for hamiltonian system allows us to integrate the dynamic as a system of free rotators. The well known Liouville-Arnold theorem provides a condition on the hamiltonian to be canonical integrable and gives an explicit construction of the action-angle variables. But the vast majority of the problems do not satisfy this condition and perturbation theory gives us the tools to investigate the dynamic in which the hamiltonian of the system is given by an integrable system perturbed by an ϵ -small function. After giving an overlook of the general problem we will focus on the case in which the perturbation is given by a trigonometric polynomial and the frequencies of the integrable systems underlying the problem satisfies the so called *Diophantine condition*.

References

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