

Formal Integral and Caustics in Dynamical Systems with Two Degrees of Freedom

A. Mylläri^{}, T. Mylläri^{**}, A. Rostovtsev^{***}, S. Vinitzky^{***}*

^{} University of Turku, Finland*

*^{**} Åbo Akademi University, Finland*

*^{***} Joint Institute for Nuclear Research, Dubna, Russia*

We continue our studies of the feasibility of the usage of formal integral in investigating structure of caustics in dynamical systems with two degrees of freedom. H'enon-Heiles and Contopoulos models are used for experiments. We use the program LINA (version for Mathematica 6) developed at JINR to construct Gustavson-like formal integral of motion. This integral is used (together with the Hamiltonian of the system) to study analytically the evolution of caustics (changes in the structure of the velocity field) in the system. Results obtained analytically by using formal integral of motion are compared with the ones obtained by the numerical integration.