

Phase-space Symmetry and the Action Function of the Pendulum Problem

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Z. Naturforsch. **57a**, 888–896 (2002); received May 25, 2002

An approach to the pendulum problem, which is an alternative to the well-known traditional treatment of that problem, has been formulated. An advantage of the new approach is provided by a full symmetry in the position and momentum variables of the Hamiltonian expression for the energy of the system. A similar symmetry holds for the Hamilton equations describing the motion of a pendulum-like point mass. Calculations of the action function for the two kinds of pendulum Hamiltonians – the traditional one and the new one – are presented.

Key words: Pendulum; Phase-space Symmetry; Action Function.