Generalizes Homogeneous Autonomous Systems and Gyroscope System

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A generalized homogeneity is defined for some autonomous system according to the character of a Lie group admitted by the system, and some properties on the first integrals of the generalized homogeneous system are given. Based on the these properties, the fourth holomorphic first integral is given under only the intrinsic condition (A=B=2C,Zg=0) for the Kovalevskaya gyroscope, and a wrong corresponding result appeared in the famous book ¡Mathematical Aspects of Classical and Celestial Mechanics¿(2ed, Springer-Verlag, New York, 1997,V.I.Arnold...) is shown. Further more, in a particular case of a heavy asymmetrical top, an invariant manifold is given.