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Nota di contenuto	Introduction -- I. Applications: Methods I: Planar reduction; Method II: The energy-momentum map -- II. Theory: Birkhoff Normalization; Singularity Theory; Gröbner bases and Standard bases; Computing normalizing transformations -- Appendix A.1. Classification of term orders; Appendix A.2. Proof of Proposition 5.8 -- References -- Index.
Sommario/riassunto	The authors consider applications of singularity theory and computer algebra to bifurcations of Hamiltonian dynamical systems. They restrict themselves to the case were the following simplification is possible. Near the equilibrium or (quasi-) periodic solution under consideration the linear part allows approximation by a normalized Hamiltonian system with a torus symmetry. It is assumed that reduction by this symmetry leads to a system with one degree of freedom. The volume focuses on two such reduction methods, the planar reduction (or polar coordinates) method and the reduction by the energy momentum mapping. The one-degree-of-freedom system then is tackled by singularity theory, where computer algebra, in particular, Gröbner basis techniques, are applied. The readership addressed consists of advanced

graduate students and researchers in dynamical systems.