

Abstract

The set of systems of differential equations that are in normal form with respect to a particular linear part has the structure of a module of equivariants, and is best described by giving a Stanley decomposition of that module. In this paper Groebner basis methods are used to determine a Groebner basis for the ideal of relations and a Stanley decomposition for the ring of invariants that arise in normal forms for Takens-Bogdanov systems. An algorithm developed by Murdock, is then used to produce a Stanley decomposition for the (normal form module) module of the equivariants from the Stanley decomposition for the ring of invariants.