

# INVARIANTS OF FINITE ABELIAN GROUPS AND THEIR USE IN SYMMETRY REDUCTION OF DYNAMICAL SYSTEMS

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We describe the computation of rational invariants of the linear action of a finite abelian group in the non-modular case and investigate its use in symmetry reductions of dynamical and polynomial systems. Finite abelian subgroups of  $GL(n, K)$  can be diagonalized which allows the group action to be accurately described by an integer matrix of exponents. We can make use of integer linear algebra to compute both a minimal generating set of invariants and the substitution to rewrite any invariant in terms of this generating set. The set of invariants provide a symmetry reduction scheme for dynamical and polynomial systems whose solution set is invariant by a finite abelian group action. A special case of the symmetry reduction algorithm applies to reduce the number of parameters in physical, chemical or biological models.

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