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io-port 01156727
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Abelian pointlikes of a monoid.
Semigroup Forum 56, No.3, 339-361 (1998).

The "Type II" kernel $K(M)$ of a finite monoid M comprises those elements of M that lie in the inverse image of the identity element, under every relational morphism from M into a finite group. The kernel plays an important role in the study of semidirect products and Malcev products of pseudovarieties of monoids (and semigroups in general). The "Rhodes conjecture" stated that membership in $K(M)$ is determined by quite a simple algorithm. It was first proved by *C. J. Ash* [Int. J. Algebra Comput. 1, No. 1, 127-146 (1991; Zbl 0722.20039)] and independently by *L. Ribes* and *P. A. Zalesskij* [Bull. Lond. Math. Soc. 25, No. 1, 37-43 (1993; Zbl 0811.20026)], the latter using the methods of profinite group theory. The author considers the abelian kernel of a finite monoid – where only relational morphisms into abelian groups are allowed – by studying the profinite topology of free abelian groups. Together with a little linear algebra, this work enables him to find an algorithm to determine membership in the abelian kernel and to obtain some information about the pointlikes with respect to such morphisms (a pointlike set must be contained in the inverse image of a single element, for every relational morphism into an abelian group). *P.R.Jones (Milwaukee)*

Keywords: finite monoids; kernels; semidirect products; Malcev products; pseudovarieties of monoids; abelian kernels; relational morphisms; profinite topology of free Abelian groups; algorithms; membership problem; pointlikes
doi:10.1007/PL00005951