Polák, Libor
Unification in varieties of completely simple semigroups. (English) ‖ Zbl 0970.20035
Dorninger, D. (ed.) et al., Contributions to general algebra 12. Proceedings of the 58th workshop on general algebra "58. Arbeitstagung Allgemeine Algebra", Vienna, Austria, June 3-6, 1999. Klagenfurt: Verlag Johannes Heyn. 337-347 (2000).

Solving an equation in a variety means solving it in the free object of that vartiety. For a variety $\mathcal{V}$ of groups, let $\mathcal{V}CS$ denote the variety of all completely simple semigroups with subgroups in $\mathcal{V}$ (completely simple semigroups are treated as unary semigroups). The aim of the paper is to compare the solvability of equations with constants in $\mathcal{V}CS$ and $\mathcal{V}$. It turns out that the solvability of an equation in n variables and m constants in $\mathcal{V}CS$ translates into the solvability of a disjunction of $\leq m^{2n}$ equations in n variables in $\mathcal{V}$ (Theorem 1). This is used to show that the unification type of $\mathcal{V}CS$ is finitary (infinitary, nullary) if and only if so is the unification type of $\mathcal{V}$ (Theorem 3). The last result, however, does not extend to the unitary unification type: the author exhibits an equation which has 5 different most general solutions in the variety of all completely simple semigroups with Abelian subgroups, while in the variety of Abelian groups, every solvable equation is known to posses a unique most general solution [see *D. Lankford, G. Butler* and *B. Brady*, Contemp. Math. 29, 193-199 (1984; Zbl 0555.68065)].

For the entire collection see [Zbl 0942.00022].

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MSC:

20M07	Varieties and pseudovarieties of semigroups
20M05	Free semigroups, generators and relations, word problems
03B35	Mechanization of proofs and logical operations
68T15	Theorem proving (deduction, resolution, etc.) (MSC2010)

Cited in **2** Documents

Keywords:

varieties of completely simple semigroups; solvability of equations; most general solutions; unification types of varieties