Discussiones Mathematicae
General Algebra and Applications 39 (2019) 101–102
doi:10.7151/dmgaa.1301

Full PDF
DM-GAA Page

ALL LINEAR-SOLID VARIETIES OF SEMIRINGS

Hippolyte Hounnon

University of Abomey-Calavi, Benin
e-mail: hi.hounnon@fast.uac.bj

and

Klaus Denecke

University of Potsdam, Germany
e-mail: klausdenecke@hotmail.com

Abstract

A variety of semirings is said to be solid if each of its identities is satisfied as hyperidentity. There are precisely four solid varieties of semirings. Each of them contains every derived algebra, where the both fundamental operations are replaced by arbitrary binary term operations. If a variety contains all linear derived algebras, where the fundamental operations are replaced by term operations induced by linear terms, it is called linear-solid. We prove that a variety of semirings is solid if and only if it is linear-solid.

Keywords: variety of semirings, hyperidentity, linear hypersubstitution, solid variety, linear-solid variety.

2010 Mathematics Subject Classification: 08B05, 08B15, 08A50.

References

[1] Th. Changphas, K. Denecke and B. Pibaljommee, Linear Terms and Linear Hypersubstitutions, preprint (KhonKaen, 2014).

[2] K. Denecke and H. Hounnon, Solid Varieties of Semirings, in: Proceedings of the International Conference on Semigroups (Braga, Portugal, 1999), World Scientific (2000) 69–86.
doi:10.1142/9789812792310-006

[3] K. Denecke and H. Hounnon, *All solid varieties of semirings*, J. Algebra **248** (2002) 107–117.
doi:10.1006/jabr.2002.9023

[4] K. Denecke and H. Hounnon, *All pre-solid varieties of semirings*, Demonstratio Math. **XXXVII** (2004) 13–34.
doi:10.1515/dema-2004-0104

[5] K. Denecke and S.L. Wismath, Hyperidentities and Clones (Gordon and Breach Science Publishers, 2000).
doi:10.1201/9781482287516

[6] K. Denecke and S.L. Wismath, Universal Algebra and Applications in Theoretical Computer Science (Chapman & Hall/CRC, 2002).
doi:10.1201/9781482285833

[7] E. Graczyńska, *On normal and regular identities and hyperidentities*, in: Proceedings of the V. Universal Algebra Symposium, Universal and Applied Algebra (Turawa, Poland, Word Scientific, 1989), 107–135.
doi:10.1007/BF01190718

[8] E. Graczyńska and D. Schweigert, *Hypervarieties of a given type*, Algebra Univ. **27** (1990) 305–318.
doi:10.1007/BF01190711

[9] U. Hebisch and H.J. Weinert, Semirings – Algebraic Theory and Applications in Computer Science, World Scientific (Singapore-New Jersey-London-HongKong, 1993).

[10] H. Hounnon, Hyperidentities in Semirings and Applications (Shaker Verlag, 2002).

[11] J. Koppitz and K. Denecke, M-solid Varieties of Algebras, Advances in Mathematics (Springer Science + Business Media, Inc., 2006).
doi:10.1007/0-387-30806-7

[12] F. Pastijn, *Idempotent distributive semirings* II, Semigroup Forum **26** (1983) 151–161.
doi:10.1007/BF02572828

[13] R. McKenzie, G. McNulty and W.F. Taylor, Algebras, Lattices Varieties, Vol. 1 (Inc. Belmonts Califormia, 1987).

Received 4 January 2019
Revised 5 February 2019
Accepted 5 February 2019