

COMPLETELY PRIME HYPERIDEALS OF TERNARY SEMIHYPERGROUPS

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Abstract

In this article, we introduce the notions of pseudosymmetric hyperideals and globally idempotent ternary semihypergroups and present various examples for them. We prove that if a ternary semihypergroup is globally idempotent, then every maximal hyperideal is a prime hyperideal. Also we study some properties of prime, completely prime and pseudosymmetric hyperideals of a ternary semihypergroup and characterize them. The interrelation among them is considered in ternary semihypergroups.

Keywords: pseudosymmetric, globally idempotent, leftsimple ternary semihypergroup.

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REFERENCES

- [1] A. Anjaneyulu, *Structure and ideal theory of semigroups-thesis*, **22** (1980).
doi:10.1007/BF02572805
- [2] A. Basar, *Application of (m, n) -gamma hyperideals in charectorization of LA-gamma semihypergroups*, *Discuss. Math. General Alg. and Appl.* **39** (2019) 135–147.
doi:10.7151/dmgaa.1304
- [3] A.H. Clifford and G.B. Preston, *The algebraic theory of Semigroups*, Amer. Math. Soc. Providence **I** (1961).

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- [4] A. Cayley, *On the theory of linear transformations*, Cambridge Math. J. **4** (1845) 193–209.
- [5] P. Corsini and V. Leoreanu, *Applications of hyperstructures and theory*, Adv. Math. Kheswer Acad. Publisher, (2003).
doi:10.1007/978-1-4757-3714-1
- [6] B. Davvaz and V. Leoreanu, *Hyperring Theory and Applications* (Inter. Academ. Press, USA, 2007).
- [7] B. Davvaz, W.A. Dudek and T. Vougiouklis, *A generalisation of n -ary algebraic systems*, Commun. Algebra **37** (2009) 1248–1263.
doi:10.1080/00927870802466835
- [8] B. Davvaz and V. Leoreanu, *Binary relations on ternary semihypergroups*, Commun. Algebra **38** (2010) 3621–3636.
doi:10.1080/00927870903200935
- [9] V.N. Dixit and S. Dawan, *A note on quasi and biideals in ternary semigroups*, Int. J. Math. Sci. **18** (1995) 501–508.
doi:10.1155/S0161171295000640
- [10] W. Dörnte, *Untersuchungen über einen verallgemeinerten Gruppenbegriff*, Math. Z. **29** (1929) 1–19.
doi:10.1007/BF01180515
- [11] W.A. Dudek, *On divisibility in n -semigroups*, Demonstratio Math. **13** (1980) 355–367.
- [12] W.A. Dudek and I. Grozdzińska, *On ideals in regular n -semigroups*, Math. Bull. **3** (1980) 29–30.
- [13] K. Hila, B. Davaaz and K. Naka, *On hyperideals structure of ternary semihypergroups*, Iranian. J. Math. Sci. Inform. **9** (2014) 81–98.
- [14] M. Karpranov, L.M. Gelfand and A. Zelevinskili, *Discriminant Resultants and Multidimensional Determinants* (Birkhauser Berlin, 1994).
- [15] R. Kerner, *Ternary algebraic structures and their applications in physics*, Universite Pierre-et-Marie-Curie, (1995), arXiv:math-ph/0011023.
- [16] D. Lehmer, *A ternary analogue of abelian groups*, Amer. J. Math. Sci. **59** (1972) 329–338.
- [17] F. Marty, *Sur une generalisation de la notion de group*, 8th Congress Math. Scandinaves, Stockholm, Sweden (1934) 45–49.
- [18] K. Naka and K. Hila, *Some properties of hyper ideals in ternary semihypergroup*, Math. Slovaca **63** (2013) 449–468.
doi:10.2478/s12175-013-0108-3
- [19] K. Naka and K. Hila, *Regularity of ternary semihypergroups*, Quasigroups and Related Systems **25** (2017) 291–306.

- [20] L. Nichefranca and K.P Shum, *Pseudo symmetric ideals of semigroup and their radicals*, Czech. Math. J. **48** (1998) 727–735.
doi:10.1023/A:1022439706828
- [21] D. Ramakotaiah and A. Anjaneyulu, *On a class of semigroups*, Simon Stevin **54** (1980) 241–249.
- [22] F.M. Sioson, *Ideal theory in ternary semigroups*, Math. Japonica **10** (1965) 63–64.
- [23] M. Shabir and Sk. Bashir, *Prime ideals in ternary semigroups*, Asian Eur. J. Math. **2** (2009) 141–154.
doi:10.1142/S1793557109000121
- [24] Y. Sarala, A. Anjaneyulu and D. Madhusudana Rao, *Pseudo symmetric ideals in ternary semigroups*, Internat. Ref. J. Eng. Sci. **1** (2012) 33–43.
- [25] Y. Sarala, A. Anjaneyulu and D. Madhusudana Rao, *Ideals in ternary semigroups*, Internat. J. Math. Eng. **203** (2013) 1950–1968.
- [26] T. Vougiouklis, *Hyper structures and their representations* (Hadronic Press Inc, Palm Harbor, USA, 1994).

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