

Natalia Didurik, Victor Shcherbacov
*Units in quasigroups with classical
Bol–Moufang type identities*

Comment.Math.Univ.Carolin. 61,4 (2020) 427–435.

Abstract: We proceed with Kunen’s research about existence of units (left, right, two-sided) in quasigroups with classical Bol–Moufang type identities, listed in paper Extra loops II, by F. Fenyves (1969). We consider those Bol–Moufang identities where it has not been decided yet whether a quasigroup fulfilling this identity has to possess a left or right identity. We also provide a table of all Moufang–Bol identities, indicating at each whether it describes the variety of groups, and whether it forces out the left unit or the right unit.

Keywords: quasigroup; Bol–Moufang type identity; right unit; left unit
AMS Subject Classification: 20N05

REFERENCES

- [1] Akhtar R., Arp A., Kaminski M., Van Exel J., Vernon D., Washington C., *The varieties of Bol–Moufang quasigroups defined by a single operation*, Quasigroups Related Systems **20** (2012), no. 1, 1–10.
- [2] Belousov V. D., *Foundations of the Theory of Quasigroups and Loops*, Nauka, Moscow, 1967 (Russian).
- [3] Birkhoff G., *Lattice Theory*, American Mathematical Society Colloquium Publications, XXV, American Mathematical Society, Providence, 1967.
- [4] Birkhoff G., *Lattice Theory*, Nauka, Moscow, 1984 (Russian).
- [5] Chein O., Orlik-Pflugfelder H., *The smallest Moufang loop*, Arch. Math. (Basel) **22** (1971), 573–576.
- [6] Côté B., Harvill B., Huhn M., Kirchman A., *Classification of loops of generalized Bol–Moufang type*, Quasigroups Related Systems **19** (2011), no. 2, 193–206.
- [7] Dart B. C., Goodaire E. G., *Loop rings satisfying identities of Bol–Moufang type*, J. Algebra Appl. **8** (2009), no. 3, 401–411.
- [8] Evans T., *Homomorphisms of non-associative systems*, J. London Math. Soc. **24** (1949), 254–260.
- [9] Fenyves F., *Extra loops. II. On loops with identities of Bol–Moufang type*, Publ. Math. Debrecen **16** (1969), 187–192.
- [10] Gagola S. M., *How and why Moufang loops behave like groups*, Quasigroups Related Systems **19** (2011), no. 1, 1–22.
- [11] Galkin V. M., *Quasigroups*, Itogi Nauki i Tekhniki, Algebra. Topology. Geometry **26** (1988), 3–44 (Russian).
- [12] Horosh G., Shcherbacov V., Tcachenco A., Yatsko T., *On groupoids with classical Bol–Moufang type identities*, Proc. of the Fifth Conf. of Mathematical Society of Moldova, IMCS-55, 2019, Chisinau, 2019, pages 77–84.
- [13] Izbash V. I., Shcherbacov V. A., *On quasigroups with Moufang identity*, in Abstracts of The Third International Conf. in memory of M. I. Kargapolov (1928–1976), Krasnoyarsk, 1993, pages 134–135 (Russian).
- [14] Jaiyéolá T. G., Ilojide E., Olatinwo M. O., Smarandache F., *On the classification of Bol–Moufang type of some varieties of quasi neutrosophic triplet loop (Fenyves BCI-Algebras)*, Symmetry **10** (2018), 427, 16 pages.
- [15] Kinyon M., Kunen K., *The structure of extra loops*, Quasigroups Related Systems **12** (2004), 39–60.
- [16] Kunen K., *Moufang quasigroups*, J. Algebra **183** (1996), no. 1, 231–234.
- [17] Kunen K., *Quasigroups, loops and associative laws*, J. Algebra **185** (1996), no. 1, 194–204.
- [18] Kuroš A. G., *Theory of Groups*, Nauka, Moscow, 1967 (Russian).
- [19] McCune W., *Prover9 and Mace4*, University of New Mexico, www.cs.unm.edu/~mccune/prover9, 2005–2010.

- [20] Pflugfelder H. O., *Quasigroups and Loops: Introduction*, Sigma Series in Pure Mathematics, 7, Heldermann, Berlin, 1990.
- [21] Scerbacova A. V., Shcherbacov V. A., *On spectrum of medial T_2 -quasigroups*, Bul. Acad. Ştiinţe Repub. Mold. Mat. **2(81)** (2016), 143–154.
- [22] Shcherbacov V., *Elements of Quasigroup Theory and Applications*, Monographs and Research Notes in Mathematics, CRC Press, Boca Raton, 2017.
- [23] Shcherbacov V., Izbash V., *On quasigroups with Moufang identity*, Bul. Acad. Ştiinţe Repub. Mold. Mat. **2** (1998), 109–116, 133, 138.