

L-ZERO-DIVISOR GRAPHS OF DIRECT PRODUCTS OF L-COMMUTATIVE RINGS

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Abstract

L-zero-divisor graphs of L-commutative rings have been introduced and studied in [5]. Here we consider L-zero-divisor graphs of a finite direct product of L-commutative rings. Specifically, we look at the preservation, or lack thereof, of the diameter and girth of the L-zero-divisor graph of a L-ring when extending to a finite direct product of L-commutative rings.

Keywords: μ -zero-divisor, L-zero-divisor graph, μ -diameter, μ -girth, finite direct products.

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REFERENCES

- [1] D.F. Anderson and P.S. Livingston, *The zero-divisor graph of a commutative ring*, J. Algebra **217** (1999), 434–447. doi:10.1006/jabr.1998.7840
- [2] M. Axtell, J. Stickles and J. Warfel, *Zero-divisor graphs of direct products of commutative rings*, Houston J. of Math. **22** (2006), 985–994.
- [3] D.F. Anderson, M.C. Axtell and J.A. Stickles, *Zero-divisor graphs in commutative rings*, in: Commutative Algebra, Noetherian and non-Noetherian Perspectives (M. Fontana, S.-E. Kabbaj, B. Olberding, I. Swanson, Eds), Springer-Verlag, New York, 2.11, 23–45.
- [4] I. Beck, *Coloring of commutative rings*, J. Algebra **116** (1988), 208–226. doi:10.1016/0021-8693(88)90202-5

- [5] S. Ebrahimi Atani and M. Shajari Kohan, *On L-ideal-based L-zero-divisor graphs*, Discuss. Math. General Algebra and Applications, to appear.
- [6] I. Goguen, *L-fuzzy sets*, J. Math. Appl. **18** (1967), 145–174.
- [7] W.J. Liu, *Operations on fuzzy ideals*, Fuzzy Sets and Systems, **11** (1983), 31–41.
- [8] L. Martinez, *Prime and primary L-fuzzy ideals of L-fuzzy rings*, Fuzzy Sets and Systems **101** (1999), 489–494. doi:10.1016/S0165-0114(97)00114-0
- [9] J.N. Mordeson and D.S. Malik, Fuzzy Commutative Algebra, J. World Scientific Publishing, Singapore, 1998.
- [10] S.B. Mulay, *Cycles and symmetries of zero-divisors*, Comm. Algebra **30** (7) (2002), 3533–3558. doi:10.1081/AGB-120004502
- [11] A. Rosenfeld, *Fuzzy groups*, J. Math. Appl. **35** (1971), 512–517.
- [12] A. Rosenfeld, *In fuzzy sets and their applications to Cognitive and Decision Processes*, Zadeh L.A, Fu K.S., Shimura M., Eds, Academic Press, New York (1975), 77–95.
- [13] R.T Yeh and S.Y. Banh, *Fuzzy relations, fuzzy graphs and their applications to clustering analysis*, in: Fuzzy sets and their applications to Cognitive and Decision Processes, Zadeh L.A, Fu K.S., Shimura M., Eds, Academic Press, New York (1975), 125–149.
- [14] L.A. Zadeh, *Fuzzy sets*, Inform. and Control **8** (1965), 338–353. doi:10.1016/S0019-9958(65)90241-X

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