

JORDAN $\{g,h\}$ -DERIVATIONS OF UNITAL ALGEBRAS

DOMINIK BENKOVIČ AND MATEJA GRAŠIĆ

Abstract. In this paper we study Jordan $\{g,h\}$ -derivations of unital algebras. For algebras having nontrivial idempotents we give the sufficient and necessary conditions that every Jordan $\{g,h\}$ -derivation is a $\{g,h\}$ -derivation. We are particularly interested in the class of algebras \mathcal{A} having the property, that every Jordan $\{g,h\}$ -derivation of \mathcal{A} is a $\{g',h'\}$ -derivation for some linear maps g' and h' .

Mathematics subject classification (2020): 16W25.

Keywords and phrases: Jordan $\{g,h\}$ -derivation, $\{g,h\}$ -derivation, Jordan derivation, derivation, unital algebra, nontrivial idempotent.

REFERENCES

- [1] D. BENKOVIČ, *Lie triple derivations of unital algebras with idempotents*, Linear and Multilinear Algebra., **63** (2015), 141–165.
- [2] D. BENKOVIČ, N. ŠIROVNIK, *Jordan derivations of unital algebras with idempotents*, Linear Algebra Appl., **437** (2012), 2271–2284.
- [3] M. BREŠAR, *Jordan derivations on semiprime rings*, Proc. Amer. Math. Soc., **104** (1988), 1003–1006.
- [4] M. BREŠAR, *Jordan derivations revisited*, Math. Proc. Cambridge Philos. Soc. **139** (2005), 411–425.
- [5] M. BREŠAR, *Jordan $\{g,h\}$ -derivations on tensor products of algebras*, Linear Multilinear Algebra, **64** (2016), 2199–2207.
- [6] J. M. CUSACK, *Jordan derivations on rings*, Proc. Amer. Math. Soc. **53** (1975), 321–324.
- [7] A. GHOSH, O. PRAKASH, *Jordan $\{g,h\}$ -derivations on algebra of matrices*, arXiv:1803.07941v1.
- [8] I. N. HERSTEIN, *Jordan derivations of prime rings*, Proc. Amer. Math. Soc. **8** (1957), 1104–1110.
- [9] N. JACOBSON, C. E. RICKART, *Jordan homomorphisms of rings*, Trans. Amer. Math. Soc. **69** (1950), 479–502.
- [10] L. KONG, J. ZHANG, *Jordan $\{g,h\}$ -derivations on triangular algebras*, Open Mathematics **18** (2020), 894–901.
- [11] Y. LI, L. VAN WYK, F. WEI, *Jordan derivations and antiderivations of generalized matrix algebras*, Operators and Matrices **7** (2013), 399–415.
- [12] A. M. SINCLAIR, *Jordan homomorphisms and derivations on semisimple Banach algebras*, Proc. Amer. Math. Soc. **24** (1970), 209–214.
- [13] J. ZHANG, W. YU, *Jordan derivations of triangular algebras*, Linear Algebra Appl. **419** (2006), 251–255.