

ANOTHER CHARACTERIZATION OF ORTHOGONALITY IN HILBERT C^* -MODULES

LJILJANA ARAMBAŠIĆ AND RAJNA RAJIĆ

Abstract. We discuss a certain relation related to the Roberts orthogonality in Hilbert C^* -modules which turns out to be equivalent to the orthogonality with respect to the C^* -valued inner product. We also describe Hilbert C^* -modules in which the Birkhoff–James orthogonality coincides with the Roberts orthogonality.

Mathematics subject classification (2010): 46B20, 47A30.

Keywords and phrases: Hilbert C^* -module, Roberts orthogonality, Birkhoff–James orthogonality, inner product orthogonality.

REFERENCES

- [1] LJ. ARAMBAŠIĆ, T. BERIĆ AND R. RAJIĆ, *Roberts orthogonality and Davis–Wielandt shell*, Linear Algebra Appl., **539** (2018), 1–13.
- [2] LJ. ARAMBAŠIĆ AND R. RAJIĆ, *A strong version of the Birkhoff–James orthogonality in Hilbert C^* -modules*, Ann. Funct. Anal., **5**, 1 (2014), 109–120.
- [3] LJ. ARAMBAŠIĆ AND R. RAJIĆ, *The Birkhoff–James orthogonality in Hilbert C^* -modules*, Linear Algebra Appl., **437**, 7 (2012), 1913–1929.
- [4] LJ. ARAMBAŠIĆ AND R. RAJIĆ, *On three concepts of orthogonality in Hilbert C^* -modules*, Linear Multilinear Algebra, **63**, 7 (2015), 1485–1500.
- [5] G. BIRKHOFF, *Orthogonality in linear metric spaces*, Duke Math. J., **1**, 2 (1935), 169–172.
- [6] J. DIXMIER, *C^* -Algebras*, North–Holland, Amsterdam, 1981.
- [7] D. ILIŠEVIĆ AND A. TURNŠEK, *Approximately orthogonality preserving mappings on C^* -modules*, J. Math. Anal. Appl., **341**, 1 (2008), 298–308.
- [8] R. C. JAMES, *Inner product in normed linear spaces*, Bull. Amer. Math. Soc., **53** (1947), 559–566.
- [9] R. C. JAMES, *Orthogonality and linear functionals in normed linear spaces*, Trans. Amer. Math. Soc., **61** (1947), 265–292.
- [10] R. C. JAMES, *Orthogonality in normed linear spaces*, Duke Math. J., **12** (1945), 291–302.
- [11] W. L. PASCHKE, *Inner product modules over B^* -algebras*, Trans Amer. Math. Soc., **182** (1973), 443–468.
- [12] G. PEDERSEN, *C^* -Algebras and Their Automorphism Groups*, Academic Press, London–New York, 1979.
- [13] D. B. ROBERTS, *On the geometry of abstract vector spaces*, Tôhoku Math. J., **39** (1934), 42–59.
- [14] A. ZAMANI, M. S. MOSLEHIAN AND M. FRANK, *Angle preserving mappings*, Z. Anal. Anwend., **34**, 4 (2015), 485–500.
- [15] N. E. WEGGE-OLSEN, *K -theory and C^* -Algebras - A Friendly Approach*, Oxford University Press, Oxford, 1993.