

## LOCAL AND 2-LOCAL ISOMETRIES BETWEEN ABSOLUTELY CONTINUOUS FUNCTION SPACES

MALIHEH HOSSEINI AND JUAN J. FONT

**Abstract.** In this paper we give a complete description of local and 2-local isometries defined between spaces of scalar-valued absolutely continuous functions on arbitrary (not necessarily compact) subsets of the real line with at least two points.

**Mathematics subject classification (2020):** Primary 47B38; Secondary 46J10, 47B33.

**Keywords and phrases:** Linear surjective isometry, absolutely continuous functions, local isometry, 2-local isometry.

### REFERENCES

- [1] H. AL-HALEES, R. J. FLEMING, *On 2-local isometries on continuous vector-valued function spaces*, J. Math. Anal. Appl. **354** (2009), 70–77.
- [2] F. CABELLO SÁNCHEZ, *Local isometries on spaces of continuous functions*, Math. Z. **251** (2005), 735–749.
- [3] R. J. FLEMING, J. E. JAMISON, *Isometries on Banach Spaces: Function Spaces*, Chapman Hall/CRC Monogr. Surv. Pure Appl. Math., 129, Chapman Hall/CRC, Boca Raton, 2003.
- [4] M. GYÖRY, *2-local isometries of  $C_0(X)$* , Acta Sci. Math. (Szeged) **67** (2001), 735–746.
- [5] O. HATORI, T. MIURA, H. OKA, H. TAKAGI, *2-local isometries and 2-local automorphisms on uniform algebras*, Int. Math. Forum **50** (2007), 2491–2502.
- [6] M. HOSSEINI, *Algebraic reflexivity of sets of bounded linear operators on absolutely continuous function spaces*, Oper. Matrices **13** (2019), 887–905.
- [7] M. HOSSEINI, *2-Local isometries between spaces of functions of bounded variation*, Positivity **24** (2020), 1101–1109.
- [8] M. HOSSEINI, J. J. FONT, *Isometries on spaces of absolutely continuous functions in a noncompact framework*, J. Math. Anal. Appl. **487** (2020), 123962.
- [9] K. JAROSZ, T. S. S. R. K. RAO, *Local isometries of function spaces*, Math. Z. **243** (2003), 449–469.
- [10] A. JIMÉNEZ-VARGAS, M. VILLEGRAS-VALLECILLOS, *2-iso-reflexivity of pointed Lipschitz spaces*, J. Math. Anal. Appl. **491** (2020), <https://doi.org/10.1016/j.jmaa.2020.124359>.
- [11] A. JIMÉNEZ-VARGAS, M. VILLEGRAS-VALLECILLOS, *2-local isometries on spaces of Lipschitz functions*, Canad. Math. Bull. **54** (2011), 680–692.
- [12] L. LI, A. M. PERALTA, L. WANG, Y.-S. WANG, *Weak-2-local isometries on uniform algebras and Lipschitz algebras*, Publ. Mat. **63** (2019) 241–264.
- [13] L. MOLNÁR, *Selected Preserver Problems on Algebraic Structures of Linear Operators and on Function Spaces*, Lecture Notes in Mathematics, 1895, Springer-Verlag, Berlin, 2007.
- [14] L. MOLNÁR, B. ZALAR, *Reflexivity of the group of surjective isometries on some Banach spaces*, Proc. Edinb. Math. Soc. **42** (1999), 17–36.
- [15] S. OI, *Algebraic reflexivity of isometry groups of algebras of Lipschitz maps*, Linear Algebra Appl. **566** (2019), 167–182.
- [16] P. ŠEMRL, *Local automorphisms and derivations on  $B(H)$* , Proc. Amer. Math. Soc. **125** (1997), 2677–2680.