

A NOTE ON OPERATOR TUPLES WHICH ARE (m, p) -ISOMETRIC AS WELL AS (μ, ∞) -ISOMETRIC

PHILIPP H. W. HOFFMANN

Abstract. We show that if a tuple of commuting, bounded linear operators $(T_1, \dots, T_d) \in B(X)^d$ is both an (m, p) -isometry and a (μ, ∞) -isometry, then the tuple (T_1^m, \dots, T_d^m) is a $(1, p)$ -isometry. We further prove some additional properties of the operators T_1, \dots, T_d and show a stronger result in the case of a commuting pair (T_1, T_2) .

Mathematics subject classification (2010): 47B99, 05A10.

Keywords and phrases: Operator tuple, normed space, Banach space, m -isometry, (m, p) -isometry, (m, ∞) -isometry.

REFERENCES

- [1] J. AGLER, *A disconjugacy theorem for Toeplitz operators*, Am. J. Math. **112** (1) (1990), 1–14.
- [2] J. AGLER AND M. STANKUS, *m -isometric transformations of Hilbert space, I*, Integr. equ. oper. theory **21** (4) (1995), 383–429.
- [3] F. BAYART, *m -Isometries on Banach Spaces*, Mathematische Nachrichten **284** (17–18) (2011), 2141–2147.
- [4] T. BERMÚDEZ, A. MARTINÓN AND V. MÜLLER, *(m, q) -isometries on metric spaces*, J. Operator Theory **72** (2) (2014), 313–329.
- [5] T. BERMÚDEZ, A. MARTINÓN AND E. NEGRÍN, *Weighted Shift Operators Which are m -Isometries*, Integr. equ. oper. theory **68** (3) (2010), 301–312.
- [6] F. BOTELHO, *On the existence of n -isometries on ℓ_p spaces*, Acta Sci. Math. (Szeged) **76** (1–2) (2010), 183–192.
- [7] P. H. W. HOFFMANN AND M. MACKEY, *(m, p) -isometric and (m, ∞) -isometric operator tuples on normed spaces*, Asian-Eur. J. Math. **8** (2) (2015).
- [8] P. HOFFMANN, M. MACKEY AND M. Ó SEARCÓID, *On the Second Parameter of an (m, p) -Isometry*, Integr. equ. oper. theory **71** (3) (2011), 389–405.
- [9] J. GLEASON AND S. RICHTER, *m -Isometric Commuting Tuples of Operators on a Hilbert Space*, Integr. equ. oper. theory **56** (2) (2006), 181–196.
- [10] S. RICHTER, *Invariant subspaces of the Dirichlet shift*, J. reine angew. Math. **386** (1988), 205–220.
- [11] O. A. SID AHMED, *m -isometric Operators on Banach Spaces*, Asian-Eur. J. Math. **3** (1) (2010), 1–19.