

NEW INEQUALITIES FOR G-FRAMES IN HILBERT C^* -MODULES

ZHONG-QI XIANG

Abstract. In this paper, we establish several new inequalities for g -frames in Hilbert C^* -modules which are different in structure from those previously obtained by Balan et al. for Hilbert space frames. We also present some equalities and inequalities for g -frames in Hilbert C^* -modules with Moore–Penrose inverses and show that they are more general and cover some results in [Xiao, XC, Zeng, XM: Some properties of g -frames in Hilbert C^* -modules. *J. Math. Anal. Appl.* 363 (2), 399–408 (2010)].

Mathematics subject classification (2010): 46L99, 42C15, 46H25.

Keywords and phrases: Hilbert C^* -module, frame, inequality, Moore–Penrose inverse.

REFERENCES

- [1] R. J. DUFFIN, A. C. SCHAEFFER, *A class of nonharmonic Fourier series*, *Trans. Amer. Math. Soc.* **72**, 2 (1952), 341–366.
- [2] I. DAUBECHIES, A. GROSSMANN, Y. MEYER, *Painless nonorthogonal expansions*, *J. Math. Phys.* **27**, 5 (1986), 1271–1283.
- [3] P. CASAZZA, *The art of frame theory*, *Taiwanese J. Math.* **4**, 2 (2000), 129–201.
- [4] O. CHRISTENSEN, *An Introduction to Frames and Riesz Bases*, Birkhäuser, Boston (2003).
- [5] W. C. SUN, *G-frames and g-Riesz bases*, *J. Math. Anal. Appl.* **322**, 1 (2006), 437–452.
- [6] P. CASAZZA, G. KUTYNIOK, *Frames of subspaces*, In *Wavelets, Frames and Operator Theory*. *Contemp. Math.*, Vol. 345, pp. 87–113. Amer. Math. Soc., Providence (2004).
- [7] O. CHRISTENSEN, Y. C. ELДАР, *Oblique dual frames and shift-invariant spaces*, *Appl. Comput. Harmon. Anal.* **17**, 1 (2004), 48–68.
- [8] S. LI, H. OGAWA, *Pseudoframes for subspaces with applications*, *J. Fourier Anal. Appl.* **10**, 4 (2004), 409–431.
- [9] A. ALDROUBI, C. CABRELLI, U. MOLTER, *Wavelets on irregular grids with arbitrary dilation matrices and frame atoms for $L^2(\mathbb{R}^d)$* , *Appl. Comput. Harmon. Anal.* **17**, 2 (2004), 119–140.
- [10] M. FRANK, D. R. LARSON, *Frames in Hilbert C^* -modules and C^* -algebras*, *J. Operator Theory* **48**, 2 (2002), 273–314.
- [11] A. KHOSRAVI, B. KHOSRAVI, *Fusion frames and g-frames in Hilbert C^* -modules*, *Int. J. Wavelets Multiresolut. Inf. Process.* **6**, 3 (2008), 433–446.
- [12] X. C. XIAO, X. M. ZENG, *Some properties of g-frames in Hilbert C^* -modules*, *J. Math. Anal. Appl.* **363**, 2 (2010), 399–408.
- [13] A. ALIJANI, M. A. DEGHAN, *G-frames and their duals for Hilbert C^* -modules*, *Bull. Iranian Math. Soc.* **38**, 3 (2012), 567–580.
- [14] A. ASKARIZADEH, M. A. DEGHAN, *G-frames as special frames*, *Turkish J. Math.* **37**, 1 (2013), 60–70.
- [15] A. ALIJANI, *Generalized Frames with C^* -Valued Bounds and their Operator Duals*, *Filomat*, **29**, 7 (2015), 1469–1479.
- [16] R. BALAN, P. CASAZZA, D. EDIDIN, G. KUTYNIOK, *A new identity for Parseval frames*, *Proc. Amer. Math. Soc.* **135**, 4 (2007), 1007–1015.
- [17] P. GÄVRUȚA, *On some identities and inequalities for frames in Hilbert spaces*, *J. Math. Anal. Appl.* **321**, 1 (2006), 469–478.

- [18] Q. X. XU, L. J. SHENG, *Positive semi-definite matrices of adjointable operators on Hilbert C^* -modules*, *Linear Algebra Appl.* **428**, 4 (2008), 992–1000.