

## INEQUALITIES OF THE DUNKL–WILLIAMS TYPE FOR ABSOLUTE VALUE OPERATORS

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*Abstract.* In this paper we give operator-valued versions of some Dunkl-Williams related inequalities for Hilbert space operators. The case of equality is also studied.

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### REFERENCES

- [1] C.A. AKEMANN, J. ANDERSON AND G.K. PEDERSEN, *Triangle inequalities in operator algebras*, Linear Multilinear Algebra, **11**, 2 (1982), 167–178.
- [2] T. ANDO AND T. HAYASHI, *A characterization of the operator-valued triangle equality*, J. Operator Theory, **58**, 2 (2007), 463–468.
- [3] LJ. ARAMBAŠIĆ AND R. RAJIĆ, *ON THE  $C^*$ -VALUED TRIANGLE EQUALITY AND INEQUALITY IN HILBERT  $C^*$ -MODULES*, Acta Math. Hungar., **119**, 4 (2008), 373–380.
- [4] J.A. CLARKSON, *Uniformly convex spaces*, Trans. Amer. Math. Soc., **40** (1936), 396–414.
- [5] W.S. CHEUNG AND J. PEČARIĆ, *Bohr's inequalities for Hilbert space operators*, J. Math. Anal. Appl., **323** (2006), 403–412.
- [6] D.G. DEFIGUEIREDO AND L.A. KARLOVITZ, *On the radial projection in normed spaces*, Bull. Amer. Math. Soc., **73** (1967), 364–368.
- [7] C.F. DUNKL AND K.S. WILLIAMS, *A simple norm inequality*, Amer. Math. Monthly, **71** (1964), 53–54.
- [8] R. HARTE, *The triangle inequality in  $C^*$ -algebras*, Filomat no. **20**, part 2 (2006), 51–53.
- [9] O. HIRZALLAH, *Non-commutative operator Bohr inequality*, J. Math. Anal. Appl., **282** (2003), 578–583.
- [10] M. KATO, K.S. SAITO AND T. TAMURA, *Sharp triangle inequality and its reverse in Banach spaces*, Math. Inequal. Appl., **10**, 2 (2007), 451–460.
- [11] E.C. LANCE, *Hilbert  $C^*$ -modules*, LMS Lecture Note Series, vol. **210**, Cambridge University Press, Cambridge, 1995.
- [12] L. MALIGRANDA, *Simple norm inequalities*, Amer. Math. Monthly, **113** (2006), 256–260.
- [13] J.L. MASSERA AND J.J. SCHÄFFER, *Linear differential equations and functional analysis I*, Ann. of Math., **67** (1958), 517–573.
- [14] P.R. MERCER, *The Dunkl-Williams inequality in an inner-product space*, Math. Inequal. Appl., **10**, 2 (2007), 447–450.
- [15] D.S. MITRINOVIĆ, *Analytic Inequalities*, Springer-Verlag, New York, 1970.
- [16] J. PEČARIĆ AND R. RAJIĆ, *The Dunkl-Williams equality in pre-Hilbert  $C^*$ -modules*, Linear Algebra Appl., **425** (2007), 16–25.
- [17] J. PEČARIĆ AND R. RAJIĆ, *The Dunkl-Williams inequality with  $n$  elements in normed linear spaces*, Math. Inequal. Appl., **10**, 2 (2007), 461–470.
- [18] R.L. THELE, *Some results on the radial projection in Banach spaces*, Proc. Amer. Math. Soc., **42**, 2 (1974), 483–486.
- [19] R.C. THOMPSON, *Convex and concave functions of singular values of matrix sums*, Pacific J. Math., **66**, 1 (1976), 285–290.

- [20] R.C. THOMPSON, *The case of equality in the matrix-valued triangle inequality*, Pacific J. Math., **82**, 1 (1979), 279–280.
- [21] F. ZHANG, *On the Bohr inequality of operators*, J. Math. Anal. Appl., **333** (2007), 1264–1271.