

## COMPLETELY CO-BOUNDED SCHUR MULTIPLIERS

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*Abstract.* A linear map  $u: E \rightarrow F$  between operator spaces is called completely co-bounded if it is completely bounded as a map from  $E$  to the opposite of  $F$ . We give several simple results about completely co-bounded Schur multipliers on  $B(\ell_2)$  and the Schatten class  $S_p$ . We also consider Herz-Schur multipliers on groups.

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### REFERENCES

- [1] M. BOŹEJKO AND G. FENDLER, *Herz-Schur multipliers and completely bounded multipliers of the Fourier algebra of a locally compact group*, Boll. Unione Mat. Ital. (6) **3-A** (1984), 297–302.
- [2] E. G. EFFROS AND Z. J. RUAN, *Operator Spaces*, The Clarendon Press, Oxford University Press, New York, 2000, xvi+363 pp.
- [3] U. HAAGERUP AND M. MUSAT, *The Effros–Ruan conjecture for bilinear forms on  $C^*$ -algebras*, Invent. Math. **174** (2008), 139–163.
- [4] W. MAJEWSKI AND M. MARCINIAK,  *$k$ -decomposability of positive maps*, Quantum probability and infinite dimensional analysis, 362–374, QP–PQ: Quantum Probab. White Noise Anal., 18, World Sci. Publ., Hackensack, NJ, 2005.
- [5] M. MARCINIAK, *On extremal positive maps acting between type I factors*, arXiv:0812.2311.
- [6] G. PISIER, *Non-commutative vector valued  $L_p$ -spaces and completely  $p$ -summing maps*, Astérisque **247** (1998), vi+131 pp.
- [7] G. PISIER, *Similarity problems and completely bounded maps*, Springer Lecture Notes 1618, Second Expanded Edition. (Incl. the solution to “the Halmos Problem”) (2001), 1–198.
- [8] G. PISIER, *Introduction to operator space theory*, London Mathematical Society Lecture Note Series, 294, Cambridge University Press, Cambridge, 2003, viii+478 pp.
- [9] G. PISIER AND D. SHLYAKHTENKO, *Grothendieck’s theorem for operator spaces*, Invent. Math. **150**, 1 (2002), 185–217.
- [10] Q. XU, *Operator-space Grothendieck inequalities for noncommutative  $L_p$ -spaces*, Duke Math. J. **131** (2006), 525–574.