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ON THE CLOSED SUBIDEALS OF $L(\ell_p \oplus \ell_q)$

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Abstract. In this paper we first review the known results about the closed subideals of the space of bounded operator on $\ell_p \oplus \ell_q$, $1 < p < q < \infty$, and then construct several new ones.

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REFERENCES

[1] G. ANDROULAKIS AND TH. SCHLUMPRECHT, *Strictly singular, non-compact operators exist on the space of Gowers and Maurey,* J. London Math. Soc. **64**, 3 (2001), 65–67.
[2] G. ANDROULAKIS AND TH. SCHLUMPRECHT, *The Banach space S is complementably minimal and subsequentially prime,* Studia Math. **156**, 3 (2003), 22–24.
[3] S. A. ARGYROS AND R. HAYDON, *A hereditarily indecomposable L_∞-space that solves the scalar-plus-compact*, Acta Math. **206** (2011), 1–54.
[4] J. BERGH AND J. LÖFSTRÖM, *Interpolation spaces. An introduction*, Grundlehren der Mathematischen Wissenschaften, No. 223, Springer-Verlag, Berlin-New York, 1976.
[5] A. BIRD, G. J. O. JAMESON AND N.-J. LAUSTSEN, *The Giesy-James theorem for general index p, with an application to closed ideals of operators on the p th quasi-reflexive James space*, in preparation.
[6] J. W. CALKIN, *Two-sided ideals and congruences in the ring of bounded operators in Hilbert space*, Ann. of Math. **42**, 2 (1941), 839–873 .
[7] M. DAWS, *Closed ideals in the Banach algebra of operators on classical non-separable spaces*, Math. Proc. Camb. Phil. Soc. **140** (2006), 317–332.
[8] R. M. DUDLEY, *Real analysis and probability*, Revised reprint of the 1989 original. Cambridge Studies in Advanced Mathematics, 74. Cambridge University Press, Cambridge, 2002. x+555 pp. ISBN: 0-521-00754-2.
[9] J. DIESTEL, H. JARCHOW, AND A. TONGE, *Absolutely summing operators*, volume 43 of Cambridge Studies in Advanced Mathematics, Cambridge University Press, Cambridge, 1995.
[10] I. S. EDELSTEIN AND B. S. MITYAGIN, *Homotopy type of linear groups of two classes of Banach spaces,* Functional Anal. Appl. **4** (1970), 221–231.
[11] M. FABIAN, P. HABALA, P. HAJEK, V. MONTESINOS SANTALUCÍA, J. PELANT, AND V. ZIZLER, *Functional analysis and infinite-dimensional geometry*, CMS Books in Mathematics/Ouvrages de Mathématiques de la SMC, 8. Springer-Verlag, New York (2001) x+451 pp.
[12] T. FIGIEL AND N. TOMCZAK-JAEGERMANN, *Projections onto Hilbertian subspaces of Banach spaces*, Israel J. Math. **33**, 2 (1979), 155–171.
[13] I. C. GOHBERG, A. S. MARKUS AND I. A. FELDMAN, *Normally solvable operators and ideals associated with them* (Russian), Bul. Akad. Štiince RSS Moldoven **76**(10), 10 (1960), 51–70. English translation: American. Math. Soc. Translat. **61** (1967), 63–84.
[14] B. GRAMSCH, *Eine Idealstruktur Banachscher Operatoralgebren*, J. Reine Angew. Math **225** (1967), 97–115.
[15] N. J. LAUSTSEN, *Maximal ideals in the algebra of operators on certain Banach spaces*, Proc. Edin. Math. Soc. **45** (2002), 523–546.
[16] N. J. LAUSTSEN, R. J. LOY, AND C. J. READ, *The lattice of closed ideals in the Banach algebra of operators on certain Banach spaces*, J. Funct. Anal. **214**, 1 (2004), 106–131.

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[17] N. J. LAUSTSEN, E. ODELL, TH. SCHLUMPRECHT, AND A. ZSAK, *Dichotomy theorems for random matrices and closed ideals of operators on* $\left(\bigoplus_{n=1}^{\infty}\ell_1^n\right)_{c_0}$, preprint.

[18] N. J. LAUSTSEN, TH. SCHLUMPRECHT, AND A. ZSAK, *The lattice of closed ideals in the Banach algebra of operators on a certain dual Banach space*, J. of Operator Theory **56**, 2 (2006), 391–402.

[19] J. LINDENSTRAUSS AND L. TZAFRIRI, *Classical Banach spaces. II*, Springer-Verlag, Berlin, 1979.

[20] R. J. LOY AND G. A. WILLIS, *Continuity of derivations on* $\mathscr{B}(E)$ *for certain Banach spaces* E, J. London Math. Soc. **40** (1989), 327–346.

[21] E. LUFT, *The two-sided closed ideals of the algebra of bounded linear operators of a Hilbertspace,* Czechoslovak Math. J. **18** (1968), 595–605.

[22] V. D. MILMAN, *Operators of class* C_0 *and* C_0^* (Russian), Teor. Funkciĭ Funkcional. Anal. i Priložen. **10** (1970), 15–26.

[23] V. D. MILMAN AND G. SCHECHTMAN, *Asymptotic Theory of Finite Dimensional Normed Spaces*, LNM 1200, Springer-Verlag, New York, 1986.

[24] A. PIETSCH, *Operator ideals*, volume 16 of Mathematische Monographien [Mathematical Monographs], VEB Deutscher Verlag der Wissenschaften, Berlin, 1978.

[25] B. SARI, TH. SCHLUMPRECHT, N. TOMCZAK-JAEGERMANN, AND V. G. TROITSKY, *On norm closed ideals in* $L(\ell_p,\ell_q)$, Studia Math. **179**, 3 (2007), 239–262.

[26] TH. SCHLUMPRECHT, *An arbitrarily distortable Banach space*, Israel J. Math. **76**, 1–2 (1991), 81–95.