

PROPERTIES OF MULTIPLICATION OPERATORS ON SPACES OF BOUNDED OPERATORS

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ABSTRACT. I will discuss the following qualitative results about the basic multiplication operators $L_A R_B; S \rightarrow ASB$, on the space $\mathcal{L}(L^p)$ of bounded operators on L^p , where $A, B \in \mathcal{L}(L^p)$ are fixed operators.

- (i) $L_A R_B$ is strictly singular $\mathcal{L}(L^p) \rightarrow \mathcal{L}(L^p)$ for $1 \leq p \leq \infty$ if and only if $A \neq 0$ and $B \neq 0$ are strictly singular operators on L^p , [LST],
- (ii) $L_A R_B$ is weakly compact $\mathcal{L}(L^p) \rightarrow \mathcal{L}(L^p)$ for $2 < p < \infty$ if and only if either A is compact, B is compact or $JA \in \overline{G_{l^2}}$ and $B \in \overline{G_{l^2}}$ for some isometry $J : L^p \rightarrow L^\infty$, [JS]. Here $A \in \mathcal{L}(L^p)$ belongs to the factorization ideal G_{l^r} if $A = UV$, where $U \in \mathcal{L}(l^r, L^p)$ and $V \in \mathcal{L}(L^p, l^r)$.

[JS] W. B. Johnson and G. Schechtman, Multiplication operators on $L(L^p)$ and l^p -strictly singular operators, arXiv: 0708.0560v1 [math.FA]

[LST] M. Lindström, E. Saksman and H.-O. Tyllı, *Strictly singular and cosingular multiplications*, Canad. J. Math. 57 (2005)