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# Square functions for Ritt operators on noncommutative \$L^p\$-spaces

### Cédric Arhancet

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For any Ritt operator \$T\$ acting on a noncommutative \$L^p\$-space, we define the notion of \textit{completely} bounded functional calculus \$H^\infty (B \gamma)\$ where \$B \gamma\$ is a Stolz domain. Moreover, we introduce the `column square functions'  $\scriptstyle T,c,\alpha=0$  $^{+\inf}_k^{2\alpha-1}|T^{k-1}(I-T)^{\alpha}(x)|^2\Big|_{L^p(M)}\$  and the `row square functions' \$\norm{x}\_{T,r,\alpha}=\Bnorm{\Big(\sum\_{k=1}^  $+ \inf\{y\}k^{2\alpha-1} \|Big(T^{k-1}(I-T)^{\alpha}(x)\}\|^2/2\|Big)^{1/2}\|_{L^p(M)}$ \$ for any \$\alpha>0\$ and any \$x\in L^p(M)\$. Then, we provide an example of Ritt operator which admits a completely bounded \$H^\infty(B\_\gamma)\$ functional calculus for some \$\gamma \in \big]0,\frac{\pi}{2}\big[\$ such that the square functions \$\norm{\cdot}\_{T,c,\alpha}\$ and \$\norm{\cdot}\_{T,r,\alpha}\$ are not equivalent. Moreover, assuming \$1<p<2\$ and \$\alpha>0\$, we prove that if \$\Ran (I-T)\$ is dense and \$T\$ admits a completely bounded \$H^\infty (B\_\gamma)\$ functional calculus for some \$\gamma \in \big]0,\frac{\pi}{2}\big[\$ then there exists a positive constant C such that for any  $x \in L^p(M)$ , there exists  $x_1, x_2 \in L^p(M)$  satisfying  $x=x_1+x_2$  and  $n=x_1$  $\{T,c,\lambda\}+ \operatorname{C}_{T,r,\lambda} C \subset \operatorname{C}_{X}_{L^p(M)}\$ . Finally, we observe that this result applies to a suitable class of selfadjoint Markov maps on noncommutative \$L^p\$-spaces.

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Scandinavica. arXiv admin note: text overlap with

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