

Quantum dynamical semigroups and exactness of  $C^*$ -algebras  
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Given a separable  $C^*$ -algebra  $A$  acting faithfully on a Hilbert space  $\mathcal{H}$  we show that  $A$  is exact iff there exists a quantum dynamical semigroup  $\phi_t$  on  $B(\mathcal{H})$  such that  $\phi_t$  is nuclear for every  $t > 0$  and  $A \subseteq \{x \in B(\mathcal{H}) \mid \|\phi_t(x) - x\| \rightarrow 0 \text{ as } t \rightarrow 0\}$ . In case  $A$  is a group algebra in its regular representation such a semigroup can be defined by a uniform embedding of the group into a Hilbert space.