



# Equivalence of $L_p$ Stability and Exponential Stability of Nonlinear Lipschitzian Semigroups

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*Abstract.*  $L_p$  stability and exponential stability are two important concepts for nonlinear dynamic systems. In this paper, we prove that a nonlinear exponentially bounded Lipschitzian semigroup is exponentially stable if and only if the semigroup is  $L_p$  stable for some  $p > 0$ . Based on the equivalence, we derive two sufficient conditions for exponential stability of the nonlinear semigroup. The results obtained extend and improve some existing ones.

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