

Is there Hille-Yosida Theorem for nonlinear semigroups on Vector Lattices?

Let \mathcal{U} be a vector lattice equipped with the order convergence structure and let $A : D(A) \rightarrow \mathcal{U}$ be an operator (not necessarily linear) with domain $D(A)$ which is dense in \mathcal{U} .

Question: Can one find a sufficient conditions on A so that A generates a semigroup T on \mathcal{U} which is strongly continuous with respect to the order convergence structure on \mathcal{U} , that is, the map $t \rightarrow T(t)u$ is order continuous for every $u \in \mathcal{U}$.

Hypothesis: There exists $\mu \geq 0$ such that for $\lambda > \mu$ the operator $(\lambda I - A)^{-1}$ is monotone increasing or equivalently $\lambda u - Au \leq \lambda v - Av \implies u \leq v$ for all $u, v \in D(A)$.