Abstract

The notions of resolvent, pseudoresolvent and a few results along with some remarkable properties are recalled. A new concept, the $L_\infty$-type pseudoresolvent is introduced.

The aim of this work is firstly to give a characterization theorem for $L_\infty$-type pseudoresolvents and for the generators of $L_\infty$-type pseudoresolvents. Moreover, the connection between the $L_\infty$-type pseudoresolvents and $C_0$-equicontinuous semigroups is pointed out.

Secondly, the main part of this work is devoted to approximation of pseudoresolvents and their generators. If $R_n, R : \Lambda \to L(X), n \geq 1$ are generated pseudoresolvents and $A_n, A$ their generators, then it is investigated under which conditions $A$ is approximated by $A_n$ and $R$ is approximated by $R_n, n \geq 1$.

In addition, the conditions under which a sequence of generated pseudoresolvents approximates a pseudoresolvent are given, and in this case the connection between generators is studied.

In the last chapter we have proved a theorem of characterization for exponentially bounded semigroups. To any exponentially bounded semigroup we have associated a projective family of semigroups acting on Banach spaces.