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Minimal convex-valued weak USCO correspondences

Commentationes Mathematicae Universitatis Carolinae, Vol. 28 (1987), No. 1, 192--193

Persistent URL: <http://dml.cz/dmlcz/106523>

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Using the result of [1] concerning the convexity of $\overline{R(A)}$ we get

Corollary 1. Let X be a reflexive rotund (H)-Banach space which is uniformly Gâteaux smooth (or equivalently X^* is weakly* uniformly rotund), $A: X \rightarrow 2^X$ an m -accretive mapping with $D(A) \subset X$. Then $\lim_{\lambda \rightarrow +\infty} \frac{1}{\lambda} J_\lambda(u) = -a^0$ for each $u \in D(A)$, where a^0 is a unique point of $\overline{R(A)}$ with the minimum norm.

As a further consequence of Thm. 2 we obtain the result of [6] concerning maximal monotone mappings in Hilbert spaces.

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MINIMAL CONVEX-VALUED WEAK USCOC CORRESPONDENCES

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We say that a function $f: V \rightarrow R$ defined on a vector space V is rotund if it is convex and $f((u+v)/2) < t$ whenever $u, v \in V$, $u \neq v$ and $f(u) = t = f(v)$. In what follows X will be a real Banach space.

Theorem 1. If there exists a weak* lower semicontinuous rotund function $f: X^* \rightarrow R$, then X belongs to the Stegall class \mathcal{S} .

We denote by w^* the weak* topology for any dual Banach space. Let D be a topological space. Then we write $F \in USCOC(F, (X^*, w^*))$ if and only if, using the weak* topology, F is a convex-valued usco correspondence from D into X^* . The set $USCOC(D, (X^*, w^*))$ is partially ordered with order \leq , where $E \leq F$ iff $E(d) \subset F(d)$ for each $d \in D$. We denote by $uscoc(D, (X^*, w^*))$ the set of all minimal elements of $USCOC(D, (X^*, w^*))$.

Theorem 2. Let $T: X \rightarrow X^*$ be a maximal monotone operator and D be an open subset of X . If $Tx \neq \emptyset$ for all x in D then $T|_D \in uscoc(D, (X^*, w^*))$.

If F is a correspondence from D into X^* then we define the set $C(F, D, X^*)$ as follows: $d \in C(F, D, X^*)$ if and only if $d \in D$ and,

using the norm topology, F is upper semicontinuous and single-valued at d . In the following theorem X will be regarded as a closed vector subspace of X^{**} .

Theorem 3. Let K be a closed convex subset of X . Then K has the Radon-Nikodým property if and only if the set $C(F, D, X^{**})$ is dense in D whenever D is a Baire space, $F \in \text{uscoc}(D, (X^{**}, w^*))$ and the set $F^{-1}(K)$ is dense in D .

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