

Weak compactness of sublevel sets in complete locally convex spaces

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© 2019 Heldermann Verlag. All rights reserved. In this work we prove that if X is a complete locally convex space and $\{f \leq \alpha\}$ is a function such that f attains its minimum for every $x \in U$, where U is an open set with respect to the Mackey topology in X , then for every $\alpha \in \mathbb{R}$ and $x \in U$ the set $\{f \leq \alpha\}$ is relatively weakly compact. This result corresponds to an extension of Theorem 2.4 in [J. Saint Raymond, *Mediterr. J. Math.* 10 (2013), no. 2, 927-940]. Directional James compactness theorems are also derived.