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EXISTENCE OF FIXED POINTS FOR A PARTICULAR MULTIFUNCTION

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Dedicated to Wataru Takahashi on the occasion of his retirement

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Abstract. In this paper, we prove that if E is an infinite-dimensional reflexive real Banach space possessing the Kadec-Klee property, then, for every compact function from the unit sphere S of E to the dual E^* satisfying the condition $\inf_{x\in S}\|f(x)\|_{E^*} > 0$, there exists $\hat{x} \in S$ such that

$$f(\hat{x})(\hat{x}) = \|f(\hat{x})\|_{E^*} \ .$$

Key Words and Phrases: Kadec-Klee property, reflexivity, upper semicontinuous multifunction, fixed point, Fan-Kakutani theorem.
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