

# PERIPHERALLY HAUSDORFF SPACES AND FIXED-POINT THEOREM

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Kupka in [1] proved that for feebly contraction with closed graph on arbitrary  $T_1$  space has unique fixed point. Thus if  $F : X \rightarrow X$  is feeble continuous contraction on Hausdorff space  $X$  then  $F$  has unique fixed point.

We proved analogous theorem for first countable Hausdorff spaces but our feeble contraction is a closed map (which sends closed subsets to closed one). The first countable assumption can not be dropped.

We have showed that locally Hausdorff  $T_1$  spaces has a unique fixed-point property for continuous feebly contractions also.

We isolate so called peripherally Hausdorff spaces and feebly<sup>+</sup> contraction map, and present some examples and basic properties of the our spaces.

We showed that peripherally Hausdorff spaces has unique fixed-point property with respect to continuous feebly<sup>+</sup> contractions.

The mentioned theorems are applied to prove existence of fixed points for mappings on compact subsets of linear spaces with weak, weak\* topologies and for compact monoids also.

Finally, we present that Čech complete  $T_1$ -spaces has unique fixed point property with respect to topological contraction maps.

This is joint work with Michał Morayne see [2].

## REFERENCES

- [1] I. Kupka, Topological conditions for the existence of fixed points, *Mathematica Slovaca* 48 (1998), 315–321.
- [2] M. Morayne. R. Rałowski, *Fixed point theorems for topological contractions and the Hutchinson operator*, <https://arxiv.org/pdf/2308.02717.pdf>

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