Lin, Weihua; Fang, Lianhua; Xie, Li-Hong
Cross-complementary subsets in paratopological groups. (English) Zbl 07415560

Summary: The following general question is considered by A. V. Arhangel’skii [Commentat. Math. Univ. Carolin. 44, No. 4, 701–709 (2003; Zbl 1098.22003)]. Suppose that $G$ is a topological group, and $F, M$ are subspaces of $G$ such that $G = MF$. Under these general assumptions, how are the properties of $F$ and $M$ related to the properties of $G$? Also, A. Arhangel’skii and M. Tkachenko [Topological groups and related structures. Hackensack, NJ: World Scientific; Paris: Atlantis Press (2008; Zbl 1323.22001)] asked what is about the above question in paratopological groups [Open problem 4.6.9, loc. cit.]. In this paper, we mainly consider this question and some positive answers to this question are given. In particular, we find many A. V. Arhangel’skii’s results hold for $k$-gentle paratopological groups.

MSC:
22A05 Structure of general topological groups
54H11 Topological groups (topological aspects)
54D35 Extensions of spaces (compactifications, supercompactifications, completions, etc.)
54D60 Realcompactness and realcompactification

Keywords:
metrizable groups; paratopological groups; $k$-gentle paratopological groups; perfect mappings; paracompact $p$-spaces; countable tightnesses

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References:
7 P. Li and L. Mou, On quasitopological groups, Topology Appl. 161, 243-247, 2014. · Zbl 1322.22003
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