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Weak completions of paratopological groups. (English) Zbl 07430015
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Summary: Given a $T_0$ paratopological group $G$ and a class $C$ of continuous homomorphisms of paratopological groups, we define the $C$-semicompletion $C[G]$ and $C$-completion $C|G|$ of the group $G$ that contain $G$ as a dense subgroup, satisfy the $T_0$-separation axiom and have certain universality properties. For special classes $C$, we present some necessary and sufficient conditions on $G$ in order that the (semi)completions $C[G]$ and $C|G|$ be Hausdorff. Also, we give an example of a Hausdorff paratopological abelian group $G$ whose $C$-semicompletion $C[G]$ fails to be a $T_1$-space, where $C$ is the class of continuous homomorphisms of sequentially compact topological groups to paratopological groups. In particular, the group $G$ contains an $\omega$-bounded sequentially compact subgroup $H$ such that $H$ is a topological group but its closure in $G$ fails to be a subgroup.

MSC:
22A15 Structure of topological semigroups
54D35 Extensions of spaces (compactifications, supercompactifications, completions, etc.)
54H11 Topological groups (topological aspects)

Keywords:
paratopological group; pseudocompact; precompact; Raïkov completion; bicompletion

Full Text: DOI arXiv

References:
[10] Xie, Li-Hong; Tkachenko, Mikhail, Simply sm-factorizable (para)topological groups and their completions, Monatshefte Math., 193, 507-529 (2020) - Zbl 1471.22003

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