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Maximal equivariant compactification of the Urysohn spaces and other metric structures.
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Let $X$ be a Tychonoff space (so $X$ can be embedded into a compact Hausdorff space) and $G$ is a topological group which acts on $X$. In this article $G$-equivariant compactifications of $X$ (i.e. $G$-embeddings into compact spaces with dense images) are investigated. It is proved that the maximal equivariant compactification of the Urysohn sphere $U_1$ with $G = \text{Iso}(U_1)$ (and of some related spaces) is the Gromov compactification, but this is not the case for unit spheres in Gurarij spaces. Then a model-theoretic approach to the investigation of equivariant compactifications is described. Also some results for the cases of transitive $G$-actions and some versions of transitivity (micro-transitivity) are proved. Several examples are given and some open questions are formulated.

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MSC:
54D35 Extensions of spaces (compactifications, supercompactifications, completions, etc.)
37B05 Dynamical systems involving transformations and group actions with special properties (minimality, distality, proximality, expansivity, etc.)
22F50 Groups as automorphisms of other structures
22F30 Homogeneous spaces
03C90 Nonclassical models (Boolean-valued, sheaf, etc.)
03C65 Models of other mathematical theories
46B04 Isometric theory of Banach spaces
54H15 Transformation groups and semigroups (topological aspects)

Keywords:
equivariant compactification; Gromov compactification; Urysohn-Gurarij space; Katětov functions; separably categorical structures; Effros’ theorem; transitivity

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References: