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Categorical Methods in Topological Groups

Question Which topological groups can be embedded as closed subgroups into a product of second-countable groups?

If one omits “closed” from the question, then the answer is well known (cf. [2], [4], and [3]). Furthermore, the answer is also known to this question if “topological groups” are replaced with “Tychonoff spaces”; such spaces are called *realcompact* (cf. [1]).

Categorical methods have been successfully used in topology for nearly half a century. In this talk, the arsenal of categorical topology is used to answer this and similar questions in the area of topological groups. It turns out that the solution to the problem leads to a notion that unifies realcompactness and the Lindelöf property for topological groups.

References

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- [4] G. I. Kac, *Isomorphic mapping of topological groups into a direct product of groups satisfying the first countability axiom*. Uspehi Matem. Nauk (N.S.) **8**(1953), no. 6(58), 107–113.
- [5] V. G. Pestov, *On the structure and embeddings of topological groups*. Manuscript deposited at VINITI (Moscow) on April 13, 1981, No. 1495-81 Dep, 41pp. (in Russian).