Some pseudocompact-like properties in certain topological groups

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In 2014, García-Ferreira and Ortiz-Castillo introduced the concept of *selective pseudocompactness* for topological spaces. This notion is stronger than pseudocompactness for topological groups, as demonstrated by García-Ferreira and Tomita in 2015.

In this talk we will present the following results:

(1) there exists a selectively pseudocompact group which is not countably pracompact;

(2) assuming the existence of a single selective ultrafilter, there exists a group which has all powers selectively pseudocompact but is not countably pracompact;

(3) there exists a countably compact group without non-trivial convergent sequences of size $2^{\mathfrak{c}}$.

The result (3) answers a question of Bellini, Rodrigues and Tomita, and its proof is a slight modification of a proof done in [1].

[1] M. Hrušák, J. van Mill, U. A. Ramos-García, and S. Shelah, *Countably compact groups without non-trivial convergent sequences*, Trans. Amer. Math. Soc., 374 (2021), pp. 1277–1296.

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