

Higher dimensional compactness properties

PAUL SZEPTYCKI *

Department of Mathematics, York University, Toronto, ON Canada
szeptyck@yorku.ca

A function f defined on the n -element subsets of ω can be viewed as an n -dimensional sequence and the convergence of such a general sequence in a space X has a natural definition. Using this, the class of n -sequentially compact spaces were introduced in [1]. The fact that compact metrizable spaces are n -sequentially compact is a topological generalization of Ramsey's Theorem. Also, the Nash-Williams Theorem leads to a notion of convergence of a generalized sequences f defined on a barrier $B \subseteq [\omega]^{<\omega}$ which gives rise to the class of B -sequentially compact spaces (defined by Todorćević and introduced in [2]). We will discuss recent results related to these notions and the more recently defined class of B -countably compact spaces [3].

References

- [1] W. Kubiś and P. Szeptycki, *On a topological Ramsey theorem* Canadian Mathematical Bulletin, 66 (2023) 156-165 DOI: <https://doi.org/10.4153/S0008439522000170>
- [2] Cesar Corral, Osvaldo Guzman, Carlos Lopez-Callejas, Pourya Memarpanahi, Paul Szeptycki, Stevo Todorćević, *Infinite dimensional sequential compactness: Sequential compactness based on barriers* arXiv:2309.04397
- [3] C. Corral, P. Memarpanahi, P. Szeptycki *High dimensional countable compactness*, in preparation.

*This is joint work with Corral, Guzman, Kubiś, Lopez-Callejas, Memarpanahi and Todorćević, .