

## Sergei Logunov

### *On Szymański theorem on hereditary normality of $\beta\omega$*

Comment.Math.Univ.Carolin. 63,4 (2022) 507–512.

**Abstract:** We discuss the following result of A. Szymański in “Retracts and non-normality points” (2012), Corollary 3.5.: If  $F$  is a closed subspace of  $\omega^*$  and the  $\pi$ -weight of  $F$  is countable, then every nonisolated point of  $F$  is a non-normality point of  $\omega^*$ . We obtain stronger results for all types of points, excluding the limits of countable discrete sets considered in “Some non-normal subspaces of the Čech–Stone compactification of a discrete space” (1980) by A. Błaszczyk and A. Szymański. Perhaps our proofs look “more natural in this area”.

**Keywords:** Čech–Stone compactification; non-normality point; butterfly-point; countable  $\pi$ -weight

**AMS Subject Classification:** 54D15, 54D35, 54D40, 54D80, 54E35, 54G20

#### REFERENCES

- [1] Bešlagić A., van Douwen E. K., *Spaces of nonuniform ultrafilters in spaces of uniform ultrafilters*, Topology Appl. **35** (1990), no. 2–3, 253–260.
- [2] Błaszczyk A., Szymański A., *Some non-normal subspaces of the Čech–Stone compactification of a discrete space*, Abstracta, 8th Winter School on Abstract Analysis, Praha, Czechoslovak Academy of Sciences, 1980, 35–38.
- [3] Gryzlov A. A., *On the question of hereditary normality of the space  $\beta\omega \setminus \omega$* , Topology and Set Theory Udmurt. Gos. Univ. Izhevsk (1982), 61–64 (Russian).
- [4] Logunov S., *On non-normality points and metrizable crowded spaces*, Comment. Math. Univ. Carolin. **48** (2007), no. 3, 523–527.
- [5] Rajagopalan M.,  *$\beta N - N - \{p\}$  is not normal*, J. Indian Math. Soc. (N.S.) **36** (1972), 173–176.
- [6] Shapirovkij B., *On embedding extremely disconnected spaces in compact Hausdorff spaces,  $b$ -points and weight of point-wise normal spaces*, Dokl. Akad. Nauk SSSR **223** (1975), 1083–1086 (Russian).
- [7] Szymański A., *Retracts and non-normality points*, Topology Proc. **40** (2012), 195–201.
- [8] Warren N. M., *Properties of Stone–Čech compactifications of discrete spaces*, Proc. Amer. Math. Soc. **33** (1972), 599–606.