

**Michael Hrušák, Yhon J. Castro**  
*Two-cardinal splitting*

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**Abstract:** We introduce and study a version of the classical splitting numbers  $\mathfrak{s}(\kappa)$  with two parameters  $\kappa \leq \lambda$  denoted by  $\mathfrak{s}(\kappa, \lambda)$  and defined as the minimal size of a family  $\mathcal{S}$  of subsets of  $\lambda$  such that for every subset  $A$  of  $\lambda$  of size  $\kappa$  there is an  $S \in \mathcal{S}$  such that  $|A \cap S| = |A \setminus S| = \kappa$ . We focus on the cases when  $\kappa = \mu^+$  and  $\lambda = \mu^{++}$ . We give several results that only depend on cardinal arithmetic, in particular, on the value that  $2^\kappa$  assumes.

**Keywords:** two cardinal splitting

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REFERENCES

- [1] Bağ Ö.F., Fischer V., *Strongly unfoldable, splitting and bounding*, MLQ Math. Log. Q. **69** (2023), no. 1, 7–14.
- [2] Ben-Neria O., Gitik M., *On the splitting number at regular cardinals*, J. Symb. Log. **80** (2015), no. 4, 1348–1360.
- [3] Brendle J., *The higher Cichoń diagram in the degenerate case*, Tsukuba J. Math. **46** (2022), no. 2, 255–269.
- [4] Jech T., *Set Theory*, Springer Monographs in Mathematics, Springer, Berlin, 2003.
- [5] Kunen K., *Set Theory*, An Introduction to Independence Proofs, Studies in Logic and the Foundations of Mathematics, 102, North-Holland Publishing Co., Amsterdam, 1983.
- [6] Raghavan D., Shelah S., *Two inequalities between cardinal invariants*, Fund. Math. **237** (2017), no. 2, 187–200.
- [7] Suzuki T., *On splitting numbers*, Mathematical Logic and Applications '92, Kyoto, 1992, Sūrikaiseikikenkyūsho Kōkyūroku **818** (1993), 118–120.
- [8] Suzuki T., *About splitting numbers*, Proc. Japan Acad. Ser. A Math. Sci. **74** (1998), no. 2, 33–35.
- [9] Zapletal J., *Splitting number at uncountable cardinals*, J. Symbolic Logic **62** (1997), no. 1, 35–42.