

Jakob Kellner, Saharon Shelah, Anda R. Tănăsie
Another ordering of the ten cardinal characteristics in Cichoń's diagram

Comment.Math.Univ.Carolin. 60,1 (2019) 61–95.

Abstract: It is consistent that

$$\aleph_1 < \text{add}(\mathcal{N}) < \text{add}(\mathcal{M}) = \mathfrak{b} < \text{cov}(\mathcal{N}) < \text{non}(\mathcal{M}) < \text{cov}(\mathcal{M}) = 2^{\aleph_0}.$$

Assuming four strongly compact cardinals, it is consistent that

$$\aleph_1 < \text{add}(\mathcal{N}) < \text{add}(\mathcal{M}) = \mathfrak{b} < \text{cov}(\mathcal{N}) < \text{non}(\mathcal{M}) < \text{cov}(\mathcal{M}) < \text{non}(\mathcal{N}) < \text{cof}(\mathcal{M}) = \mathfrak{d} < \text{cof}(\mathcal{N}) < 2^{\aleph_0}.$$

Keywords: set theory of the reals; Cichoń's diagram; forcing; compact cardinal

AMS Subject Classification: 03E17

REFERENCES

- [1] Bartoszyński T., *Combinatorial aspects of measure and category*, Fund. Math. **127** (1987), no. 3, 225–239.
- [2] Bartoszyński T., Judah H., *Set Theory, On the Structure of the Real Line*, A.K. Peters, Wellesley, 1995.
- [3] Brendle J., *Larger cardinals in Cichoń's diagram*, J. Symbolic Logic **56** (1991), no. 3, 795–810.
- [4] Brendle J., Mejía D. A., *Rothberger gaps in fragmented ideals*, Fund. Math. **227** (2014), no. 1, 35–68.
- [5] Cardona M. A., Mejía D. A., *On cardinal characteristics of Yorioka ideals*, available at arXiv:1703.08634 [math.LO] (2018), 35 pages.
- [6] Engelking R., Karłowicz M., *Some theorems of set theory and their topological consequences*, Fund. Math. **57** (1965), 275–285.
- [7] Goldstern M., Kellner J., Shelah S., *Cichoń's maximum*, available at arXiv:1708.03691 [math.LO] (2018), 21 pages.
- [8] Goldstern M., Mejía D. A., Shelah S., *The left side of Cichoń's diagram*, Proc. Amer. Math. Soc. **144** (2016), no. 9, 4025–4042.
- [9] Horowitz H., Shelah S., *Saccharinity with ccc*, available at arXiv:1610.02706 [math.LO] (2016), 23 pages.
- [10] Judah H., Shelah S., *The Kunen-Miller chart (Lebesgue measure, the Baire property, Laver reals and preservation theorems for forcing)*, J. Symbolic Logic **55** (1990), no. 3, 909–927.
- [11] Kamburelis A., *Iterations of Boolean algebras with measure*, Arch. Math. Logic **29** (1989), no. 1, 21–28.
- [12] Kellner J., Tănăsia A. R., Tonti F. E., *Compact cardinals and eight values in Cichoń's diagram*, J. Symb. Log. **83** (2018), no. 2, 790–803.
- [13] Mejía D. A., *Matrix iterations and Cichoń's diagram*, Arch. Math. Logic **52** (2013), no. 3–4, 261–278.
- [14] Miller A. W., *A characterization of the least cardinal for which the Baire category theorem fails*, Proc. Amer. Math. Soc. **86** (1982), no. 3, 498–502.
- [15] Osuga N., Kamo S., *Many different covering numbers of Yorioka's ideals*, Arch. Math. Logic **53** (2014), no. 1–2, 43–56.
- [16] Shelah S., *Covering of the null ideal may have countable cofinality*, Fund. Math. **166** (2000), no. 1–2, 109–136.