

PAVING SMALL MATRICES AND THE KADISON–SINGER EXTENSION PROBLEM

GARY WEISS AND VREJ ZARIKIAN

Abstract. We compute paving parameters for classes of small matrices and the matrices that yield them. The convergence to 1 or not of the sequence of these parameters is equivalent to the Kadison-Singer Extension Problem.

Mathematics subject classification (2010): Primary: 46L30; secondary: 15A60.

Keywords and phrases: Kadison-Singer extension problem, Anderson’s paving problem.

REFERENCES

- [1] C. AKEMANN, N. WEAVER, *B(H) has a pure state which is not multiplicative on any masa*, Proc. Natl. Acad. Sci. USA, **105**, 14 (2008), 5313–5314 (electronic).
- [2] J. ANDERSON, *Extensions, restrictions, and representations of states on C^* -algebras*, Trans. Amer. Math. Soc., **249**, 2 (1979), 303–329.
- [3] J. ANDERSON, *Extreme points in sets of positive linear maps on $B(H)$* , J. Funct. Anal., **31**, 2 (1979), 195–217.
- [4] K. BERMAN, H. HALPERN, V. KAFTAL, G. WEISS, *Matrix norm inequalities and the relative Dixmier property*, Integral Equations Operator Theory, **11**, 1 (1988), 28–48.
- [5] P. CASAZZA, D. EDIDIN, D. KALRA, V. I. PAULSEN, *Projections and the Kadison-Singer problem*, Oper. Matrices, **1**, 3 (2007), 391–408.
- [6] P. J. DAVIS, *Circulant matrices*, A Wiley-Interscience Publication. Pure and Applied Mathematics. John Wiley & Sons, New York-Chichester-Brisbane, 1979. xv+250 pp.
- [7] H. HALPERN, V. KAFTAL, G. WEISS, *Matrix pavings in $B(H)$* , Operators in indefinite metric spaces, scattering theory and other topics (Bucharest, 1985), 201–214, Oper. Theory Adv. Appl., 24, Birkhäuser, Basel, 1987.
- [8] R. V. KADISON, I. M. SINGER, *Extensions of pure states*, Amer. J. Math., **81** (1959), 383–400.
- [9] R. MATHIAS, *The spectral norm of a nonnegative matrix*, Linear Algebra Appl., **139** (1990), 269–284.
- [10] V. I. PAULSEN, M. RAGHUPATHI, *Some new equivalences of Anderson’s paving conjectures*, Proc. Amer. Math. Soc., **136**, 12 (2008), 4275–4282.
- [11] R. C. READ, R. J. WILSON, *An atlas of graphs*, Oxford Science Publications. The Clarendon Press, Oxford University Press, New York, 1998. xii+454 pp.