

Minimal Pairs Representing Selections of Four Linear Functions in \mathbb{R}^3

Grzybowski, J.; Pallaschke, Diethard; Urbanski, R.

Faculty of Mathematics and Computer Science Adam Mickiewicz University Matejki 48/49 60769 Poznan Poland
Institut f. Statistik und Wirtschaftstheorie Universität Karlsruhe Kaiserstr. 12 76128 Karlsruhe Germany
Faculty of Mathematics and Computer Science Adam Mickiewicz University Matejki 48/49 60769 Poznan Poland



Abstract: We investigate minimal pairs of continuous selections of four linear functions in three dimensional space. Our purpose is to find minimal pairs of compact convex sets (polytopes) which represent all 166 continuous selections [see S. G. Bartels, L. Kuntz and S. Scholtes, *Nonlinear Analysis, Theory, Meth. Appl.* 24 (1995) 385-407] which can be made from the three coordinate functions and its negative sum. We find that these 166 selections are represented by 16 essentially different minimal pairs which were studied in previous papers of the authors [see J. Grzybowski, *Arch. Math.* 63 (1994) 173-181, and D. Pallaschke, S. Scholtes, R. Urbanski, *Bull. Polish. Acad. Sci. Math.* 39 (1991) 105-109]. Three out of 16 cases are minimal pairs that are not unique minimal representations in their own quotient classes. One of these quotient classes was already studied in the above mentioned paper of J. Grzybowski and in the papers of D. Pallaschke, R. Urbanski, *Z. Oper. Res.* 37 (1993) 129-150, and M. Wiernowolski, *Studia Math.* 124 (2) (1997) 149-154.

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