

On Quasi-Homogeneous Copulas

Gaspar Mayor; Radko Mesiar; Joan Torrens

Abstract: Quasi-homogeneity of copulas is introduced and studied. Quasi-homogeneous copulas are characterized by the convexity and strict monotonicity of their diagonal sections. As a by-product, a new construction method for copulas when only their diagonal section is known is given.

Keywords: copula; diagonal section; quasi-homogeneity;

AMS Subject Classification: 62H05; 62E10;

References

- [1] J. Aczél: Lectures on Functional Equations and Their Applications (Math. Sci. Engrg., Vol. 19). Academic Press, New York 1966.
- [2] C. Alsina, M. J. Frank, and B. Schweizer: Associative Functions. Triangular Norms and Copulas. World Scientific Publishing, Singapore 2006.
- [3] S. Bertino: Sulla dissomiglianza tra mutabili cicliche. *Metron* 35 (1977), 53–88.
- [4] B. De Baets, H. De Meyer, and R. Mesiar: Asymmetric semilinear copulas. *Kybernetika* 43 (2007), 221–233.
- [5] F. Durante, A. Kolesárová, R. Mesiar, and C. Sempi: Copulas with given diagonal sections: Novel constructions and applications. *Internat. J. Uncertainty, Fuzziness and Knowledge-Based Systems* 15 (2007), 397–410.
- [6] F. Durante, A. Kolesárová, R. Mesiar, and C. Sempi: Semilinear copulas. *Fuzzy Sets and Systems* 159 (2008), 63–76.
- [7] F. Durante, R. Mesiar, and C. Sempi: On a family of copulas constructed from the diagonal section. *Soft Computing* 10 (2006), 490–494.
- [8] F. Durante and C. Sempi: Semicopulae. *Kybernetika* 41 (2005), 315–328.
- [9] B. R. Ebanks: Quasi-homogeneous associative functions. *Internat. J. Math. Math. Sci.* 21 (1998), 351–358.

- [10] G. A. Fredricks and R. B. Nelsen: Copulas constructed from diagonal sections. In: *Distributions with Given Marginals and Moment Problems* (V. Beneš and J. Štěpán, eds.), Kluwer Academic Publishers, Dordrecht 1977, pp. 129–136.
- [11] G. A. Fredricks and R. B. Nelsen: The Bertino family of copulas. In: *Distributions with Given Marginals and Statistical Modelling* (C. M. Cuadras, J. Fortiana, and J. A. Rodríguez Lallena, eds.), Kluwer, Dordrecht 2002, pp. 81–91.
- [12] C. Genest, J. J. Quesada Molina, J. A. Rodríguez Lallena and C. Sempi: A characterization of quasi-copulas. *J. Multivariate Anal.* 69 (1999), 193–205.
- [13] E. P. Klement and A. Kolesárová: Extension to copulas and quasi-copulas as special 1-Lipschitz aggregation operators. *Kybernetika* 41 (2005), 329–348.
- [14] E. P. Klement, R. Mesiar, and E. Pap: *Triangular Norms*. Kluwer Academic Publishers, Dordrecht 2000.
- [15] R. B. Nelsen: *An Introduction to Copulas*. Second edition (Springer Series in Statistics). Springer-Verlag, New York 2006.