

Generalization of the Concept of Motzkin Decomposable Closed Convex Sets

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A set is called Motzkin decomposable when it can be expressed as the Minkowski sum of a compact convex set with a closed convex cone. In this talk we shall present several generalizations of this concept. We consider the so-called Motzkin predecomposable sets, OM decomposable sets and weakly Motzkin predecomposable sets, i.e., sets which are sum of a compact convex set with a convex cone, sum of an open bounded convex set with a convex cone, and sets which are Minkowski sum of a bounded convex set with a convex cone, respectively. Necessary and sufficient conditions, characterizing these sets are found and discussed.

References

- [1] Goberna, M. A., González, E., Martínez-Legaz, J. E., Todorov, M. I.: Motzkin decomposition of closed convex sets. *J. Math. Anal. Appl.* 364, 209–221 (2010).
- [2] Goberna, M. A., Martínez-Legaz, J. E., Todorov, M. I.: On Motzkin decomposable sets and functions. *J. Math. Anal. Appl.* 372, 525–537 (2010).
- [3] Goberna M. A., Iusem A., Martínez-Legaz, J. E., Todorov M. I.: Motzkin decomposition of closed convex sets via truncation. *J. Math. Anal. Appl.* 400, 35–47 (2013).
- [4] Goberna M. A., Todorov M. I. On the stability of the Motzkin representation of closed convex sets. *Set-Valued and Variational Analysis*, (2013), Vol. 21, Issue 4, pp. 635–647, DOI: 10.1007/s11228-013-0251-6.

- [5] Iusem A., J. E. Martínez-Legaz and Todorov M. I. Motzkin predecomposable sets. *Journal of Global Optimization: Volume 60, Issue 4 (2014)*, pp. 635–647, DOI: 10.1007/s10898-013-0097-3.
- [6] J. E. Martínez-Legaz and Todorov M. I. Weakly Motzkin predecomposable sets. to appear in *Set-Valued and Variational Analysis*.
- [7] Iusem A., Todorov M. I. On OM decomposable sets. IMPA, Rio de Janeiro, BR, Preprint serie A774/2016, <http://preprint.impa.br/visualizar?id=6878>.