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EQUILIBRIUM UNDER UNCERTAINTY WITH FUZZY PAYOFF

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Abstract. We study n-player games where players form non-additive beliefs about opponent's decisions and answer with pure strategies. The concept of an equilibrium under uncertainty was introduced by J. Dow and S. Werlang (1994) for two players and was extended to n-player games by J. Eichberger and D. Kelsey (2000). The authors consider payoff functions expressed by Choquet integral. The concept of an equilibrium under uncertainty with payoff functions expressed by the Sugeno integral were considered by T. Radul (2018). We consider a generalization of this result with payoff functions expressed by fuzzy integral generated by arbitrary continuous t-norm.

1. Introduction

The classical Nash equilibrium theory is based on fixed point theory and was developed in frames of linear convexity. The mixed strategies of a player are probability (additive) measures on a set of pure strategies. Interest to Nash equilibria in more general frames started to grow rapidly in the last decades. For instance, Aliprantis, Florenzano and Tourky [1] work in ordered topological vector spaces, Luo [19] in topological semilattices, Vives [31] in complete lattices. Briec and Horvath [3] proved existence of Nash equilibrium point for B-convexity and MaxPlus convexity.

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