Splitting games over finite sets

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Abstract: This paper studies zero-sum splitting games with finite sets of states. Players dynamically choose a pair of martingales $\{p_t, q_t\}_t$, in order to control a terminal payoff $u(p_\infty, q_\infty)$. A first part introduces the notion of "Mertens-Zamir transform" of a real-valued matrix and use it to approximate the solution of the Mertens-Zamir system for continuous functions on the square $[0,1]^2$. A second part considers the general case of finite splitting games with arbitrary correspondences containing the Dirac mass on the current state: building on Laraki-Renault 2020, we show that the value exists by constructing non Markovian ε-optimal strategies and we characterize it as the unique concave-convex function satisfying two new conditions.

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