On the Relation between Finitely and Infinitely Repeated Games with Incomplete Information

by

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Abstract

For a class of repeated two‑person zero‑sum games with incomplete information it was proved by AUMANN and MASCHLER that $\lim_{n\to\infty} v_n$ exists, v_n being the value of the game with n repetitions. As for the speed of convergence AUMANN and MASCHLER showed that the error term $\mathsf{d}_n = \left| v_n - \lim v_n \right|$ is bounded from above by $c/\sqrt{n}$ for some positive constant c. Both results have been generalized by MERTENS and ZAMIR. It is shown in this paper that the above mentioned theorem about the speed of convergence is sharp in the sense that there are games in which $\mathsf{d}_n \geq c'/\sqrt{n}$ for some positive constant c'. However there are games for which d_n is of a lower order of magnitude, for instance $c'(\log n)/n \leq \mathsf{d}_n \leq c(\log n)/n$ or $c'/n \leq \mathsf{d}_n \leq c/n$. Sufficient conditions are given here for games to belong to one of the categories as well as examples of games from each category.