The Use Of Banach-Mazur Game In Variational Analysis: Some Recent Results

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Abstract

In this talk we will present some recent results which demonstrate the use of the well-known Banach-Mazur game to tackle problems from variationl analysis. The first example is related to variational principles for **maximization** of lower semicontinuous functions (not for minimization of such functions which is the usual case). It turns out that the existence of a winning strategy for one of the players in the Banach-Mazur game characterizes the validity of a generic variational principle for maximization of continuous bounded perturbations of a fixed lower semicontunuous function which is bounded from above.

The second example is related to the existence of residually defined selections of a certain class of set-valued mappings. Here again, the existence of special type of winning strategies for one of the players in the Banach-Mazur game characterizes the existence of such selections. The results are based on the two papers given in the references.

References

[1] M. Ivanov, P.S. Kenderov and J.P. Revalski, Variational principles for maximization problems with lower-semicontinuous goal functions, *Set-Valued and Variational Analysis*, **30**, 559—571 (2022).

[2] P.S. Kenderov and J.P. Revalski, Once again on topological spaces containing a dense completely metrizable subset, *Topology and its Appl.*, accepted.