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METRIZABILITY OF LÉVY TOPOLOGY ON NONADDITIVE MEASURES

Weak convergence of measures on a topological space not only plays a very important role in probability theory and statistics, but is also interesting from a topological measure theoretic view, since it gives a convergence closely related to the topology of the space on which the measures are defined. Thus, it is possible to study weak convergence of measures on a topological space in association with some topological properties of the space, such as the metrizability, separability and compactness. Nonadditive measures, which are set functions that are monotonic and vanish at the empty set, have been extensively studied; see Wang and Klir. They are closely related to nonadditive probability theory and the theory of capacities and random capacities. Nonadditive measures have been used in expected utility theory, game theory, and some economic topics under Knightian uncertainty. The notion of weak convergence of nonadditive measures was formulated by Girotto and Holzer in a fairly abstract setting. Some of their fundamental results for weak convergence, such as the portmanteau theorem and the direct and converse Prokhorov theorems, have been extended to the nonadditive case. In particular, the portmanteau theorem allows us to show that the weak topology, which is the topology generated by weak convergence, coincides with the Lévy topology, which is the topology generated by convergence of measures on a special class of sets. In this talk, we will present successful nonadditive analogs of the theory of weak convergence of measures with a particular focus on metrizability and we will also supply weak convergence methods to related fields; see the authorś recent paper. This work is supported by Grant-in-Aid for Scientific Research No. 20540163, Japan Society for the Promotion of Science (JSPS).

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