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A RANDOM MULTIVALUED UNIFORM BOUNDEDNESS PRINCIPLE

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ABSTRACT. We present a generalization of the Uniform Boundedness Principle valid for random multivalued linear operators, i.e., multivalued linear operators taking values in the space $L_0(\Omega, Y)$ of random variables defined on a probability space (Ω, \mathcal{A}, P) with values in the Banach space Y . Namely, for a family of such operators that are continuous with positive probability, if the family is pointwise bounded with probability at least $\delta > 0$, then the operators are uniformly bounded with a probability that in each case can be estimated in terms of δ and the index of continuity of the operator. To achieve this result, we develop the fundamental theory of multivalued linear operators on general topological vector spaces. In particular, we exhibit versions of the Closed Graph Theorem, the Open Mapping Theorem, and the Uniform Boundedness Principle for multivalued operators between F -spaces.

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