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ROUGH IDEAL CONVERGENCE OF DOUBLE SEQUENCES IN PROBABILISTIC NORMED SPACE

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Abstract. In this work, we study the notions of rough I_2-Cauchy and rough I_2^*-Cauchy for double sequences in the setting of random 2-normed space. The notions of rough I_2-convergence, rough I_2^*-convergence, rough I_2-limit points, and rough I_2-cluster points of probabilistic normed double sequences are also developed and investigated. By proving that rough $I2*$-convergence implies rough $I2$-convergence in probabilistic normed space, we discuss the connection between rough I_2- and rough I_2^*-convergence. Additionally, we have demonstrated by an example that rough I_2-convergence in probabilistic normed space does not imply rough I_2^*-convergence. The significance of condition (AP2) in summability analysis utilizing ideals is supported by our findings.

1. Introduction

Menger [16] connected each pair of points in a set to a distribution function in order to generalize the metric axioms. This idea, which was originally described as a statistical metric space and is now known as a probabilistic metric space, has been significantly improved by Schweizer and Sklar [22]. To replace nonnegative real values with distribution functions was one idea. One of the most important families of probabilistic metric spaces is the family of probabilistic normed spaces. Probabilistic normed spaces are real linear spaces where the norm of each vector is a probability distribution function rather than a number. The first reference of these places was made by Šerstnev in 1963, according to [21]. A new definition of PN spaces was offered by Alsina et al. in [2] that incorporates Šerstnev's and inexorably leads to the identification of the Menger spaces as the primary class of PN spaces.

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