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ROUGH $\mathcal{I}_2$-CONVERGENCE OF SEQUENCES IN GRADUAL NORMED LINEAR SPACES

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Abstract. In the present article, we set forth with the new concept of rough $\mathcal{I}_2$ and $\mathcal{I}_2^*-$convergence in gradual normed linear spaces (GNLS). We produce significant results that present several fundamental features of the notions utilizing $\mathcal{I}_2^r(\mathcal{G})$ and $\mathcal{I}_2^{*,r}(\mathcal{G})-$limit set. In the end, we investigate their interrelationships and establish a necessary and sufficient condition for the equivalency of the two notions.

Keywords. Ideal, rough ideal convergence, $\mathcal{I}_2^r(\mathcal{G})-$limit set, gradual normed linear space, gradual number.

AMS (MOS) subject classification: 40A35, 60B10, 60B12.

1 Introduction

The notion of fuzzy sets (FS) was given by [46]. These days, it has extensive applications in various areas of engineering and science. The concept "fuzzy number"(FN):is significant in the work of FS theory. FNs are essentially the generalisation of intervals, not numbers. Indeed, FNs do not supply a couple of algebraic features of the well-known numbers. For this reason the concept "FN":is debatable to some researchers owing to its not similar behaviour. The concept "fuzzy intervals":is commonly utilized by several researchers in place of FNs. In order to succeed the confusion of the authors, Fortin et al. [27] put forward to the concept of gradual real numbers (GRNs) as elements of fuzzy intervals. GRNs are known by their respective assignment function whose domain is the interval $(0, 1]$. So, each $\mathbb{R}$ numbers can be thought of as a gradual number with a constant assignment function. Furthermore, the GRNs supply all the algebraic features of the $\mathbb{R}$ numbers and have been utilized in optimization problems and computation.