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SOLUTION OF FRACTIONAL INTEGRAL EQUATION VIA HYBRID CONTRACTIONS IN METRIC-LIKE SPACES

PANKAJ, MANOJ KUMAR†, AND VINIT MOR

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Abstract. In this manuscript, we shall introduce hybrid contractions and prove fixed point theorems for such contractions in metric-like spaces. Some existing results of literature shall also be deduced from our main results. We shall provide an example to support the main result. In the end, a fractional integral equation shall also be solved using our main result.

1. Introduction

Since the last few decades solving fractional differential and integral equation in non linear functional analysis is the major topic of research. Fixed point technique is one of the technique to obtain the solution of such fractional equations. In 1922, Banach [14] was the first Mathematician, who gave the constructive method to get the fixed point. Later by seeing the usability of fixed point results Kannan ([11]-[12]) in 1968 tried to generalize the Banach contraction principle. In this sequence, in 2018, Karapinar [3] introduce the new notion of interpolation by revisiting Kannan contraction in metric space as follows:
Let (X, d) be a metric space and T be a self map on X. Then T is said to be interpolative Kannan type contraction, if there exists $\lambda \in (0, 1)$ such that

$$d(Tx, Ty) \leq \lambda[d(x, Tx)]^{\alpha}.[d(y, Ty)]^{1-\alpha}$$

for all $x, y \in X$.
In 2019, Karapinar and Fulga [4] defined hybrid contraction using interpolation in b-metric space. In the same year, Karapinar *et al.* [7] solved a Volterra fractional integral equation by defining hybrid contractions in metric spaces. For more results via hybrid and iterpolative contractions see([2], [6], [8], [9]). In this paper we shall also find the solution of Volterra fractional integral equation by defining hybrid contractions in metric

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† *Corresponding author*