THE KRASNOSEL'SKIĬ–MANN ALGORITHM
FOR A COUNTABLE FAMILY
OF NON-SELF LIPSCHITZIAN MAPPINGS

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Abstract. In this paper, we address an open question regarding common fixed points of a family of non-self mappings. More precisely, we employ the Krasnosel'skiĭ–Mann algorithm to approximate common fixed points of a countable family of Lipschitzian non-self mappings in Banach spaces under different conditions.

1. Introduction

Krasnosel'skiĭ–Mann method [9], [11], [12], [25] has been vastly studied in the literature and impressive amount of papers have appeared in last few decades for a self-mapping on a subset of a Banach space (resp. a Hilbert space) (cf. [5] and references therein). However, if the mapping is non-self then the next iterate of this method may not belong to the domain set. Thus one need to bring back it to the domain set to execute the next iteration. To overcome this problem, authors in [3], [6], [28] proposed nearest point projection techniques and obtained certain convergence results. Nevertheless, in many real world applications, sometimes, the process of computing projection is not handy and it may require approximation algorithm by itself, even in the case of the nearest point projection on Hilbert spaces [7], [13]. To remove the necessity of the nearest