

## $\delta^c$ -CLOSURE OPERATOR IN FUZZY SETTING

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(Received: Aug. 23, 2021 Accepted: Apr. 02, 2022 Published: Apr. 30, 2022)

**Abstract:** This paper deals with fuzzy regular open set [1]. Here a new type of fuzzy closure operator is introduced which is not an idempotent operator. First we characterize this operator by fuzzy open set. It is shown that this operator is distributed over union but not on intersection. Next we establish the mutual relationship of this operator with the operators defined in [2, 3, 4, 6, 7, 8, 9, 11]. Lastly, we show that in fuzzy almost regular space [14], this newly defined closure operator will be idempotent.

**Keywords and Phrases:** Fuzzy regular open set, fuzzy semiopen set, fuzzy  $\beta$ -open set, fuzzy preopen set, fuzzy  $\delta^c$ -closed set, fuzzy  $\gamma$ -open set, fuzzy almost regular space,  $\delta^c$ -convergence of a fuzzy net.

**2020 Mathematics Subject Classification:** 54A40, 03E72.

### 1. Introduction

After introducing fuzzy closure operator by Chang [9], several types of fuzzy closure-like operators are introduced and studied by many mathematicians. In this context we have to mention fuzzy  $\beta^*$ -closure operator [2], fuzzy  $s^*$ -closure operator [3], fuzzy  $p^*$ -closure operator [4], fuzzy  $\gamma^*$ -closure operator [6], fuzzy  $s^c$ -closure operator [7], fuzzy  $\beta^c$ -closure operator [8]. Fuzzy  $\delta$ -closure operator is introduced in [11]. Here we introduce fuzzy  $\delta^c$ -closure operator which is coarser than the fuzzy  $\delta$ -closure operator and for a fuzzy open set, these two operators coincide. Again this newly defined operator is not an idempotent operator, in general. Also it is