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THE TOPOLOGY OF θ_e-OPEN SETS

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Abstract. This paper aims is to introduce a new class of open set defined using e-closure operator, which we call the θ_e-open set. It is worth noting that the family of all θ_e-open sets forms a topology. We then investigate the relationship of this set to the other well-known concepts in topology such as the classical open, θ-open and e-open sets. We also characterize the concepts of θ_e-connected space, some versions of separation axioms with respect to θ_e-open sets, and θ_e-continuous function from an arbitrary topological space into the product space.

1. Introduction and Preliminaries

Open sets are the fundamental building blocks of topology. Many authors have developed different versions of open sets including its weaker and stronger versions. The first initiation was done by Levine [16] in 1963 where he introduce the concepts of semi-open set, semi-closed set and semi-continuity of a function.

A subset O of a topological space X is semi-open [16] if $O \subseteq Cl(Int(O))$. Equivalently, O is semi-open if there exists an open set G in X such that $G \subseteq O \subseteq Cl(G)$. A subset F of X is semi-closed if its complement $X \setminus F$ is semi-open in X. Let A be a subset of a space X. A point $p \in X$ is a semi-closure point of A if for every semi-open set G in X containing x, $G \cap A \neq \varnothing$. We denote by $sCl(A)$ the set of all semi-closure points of A.

In 1968, Veličko [23] introduce the concept θ-continuity between topological spaces and defined the concepts of θ-closure and θ-interior of a set. The work of Veličko was continued by Dickman and Porter [5, 6], Joseph [14], and Long and Herrington [17]. Then several authors have obtained interesting results related to θ-open sets, see [1, 4, 12, 13, 15, 19].

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