

Characterizations and Properties of Paracompact and Strongly Paracompact Spaces

Nabeela Abu-Alkishik

Mathematics, Faculty of Science, Jerash University, Jerash, Jordan

Abstract:

This research advances the concept, characteristics, and theorems of Paracompactness and Strongly compactness in topological spaces by introducing a special type of covering that incorporates novel and impact properties of paracompact and strongly paracompact in topological spaces. This study introduces the notion of "properly closed hereditary properties" within the framework of topological spaces. We investigate whether paracompact, metacompact, and ω -spaces satisfy this property. By providing definitive answers and establishing novel characterizations, offer new insights into the topological structures of paracompact and meta-compact spaces. A central result of this paper is a proof that a space E is strongly paracompact if and only if it is paracompact, a finding that significantly extends classical results concerning locally compact spaces. Furthermore, we present additional findings on paracompact spaces, supported by rigorous proofs and comprehensive analysis. These results contribute to the ongoing discourse in the field and clarify the complex interrelationships among key topological features. This work advances the study of topological spaces by providing a more robust theoretical foundation for understanding their inherent qualities. Several examples are discussed. As a result, several new properties such as pairwise locally paracompact space, and pairwise locally nearly paracompact spaces were established.

Keywords:

Topological spaces, properly closed hereditary properties, strongly paracompact, Metacompact spaces, locally compact spaces.