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The Topological Weighted Centroid (TWC): A topological approach to the time-space structure of epidemic and pseudo-epidemic processes

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Abstract

This paper offers the first systematic presentation of the topological approach to the analysis of epidemic and pseudo-epidemic spatial processes. We introduce the basic concepts and proofs, at test the approach on a diverse collection of case studies of historically documented epidemic and pseudo-epidemic processes. The approach is found to consistently provide reliable estimates of the structural features of epidemic processes, and to provide useful analytical insights and interpretations of fragmentary pseudo-epidemic processes. Although this analysis has to be regarded as preliminary, we find that the approach's basic tenets are strongly corroborated by this first test and warrant future research in this vein.

Keywords

Topological Weighted Centroid; Alpha Point; Alpha, Beta, Gamma, Theta, Iota scalar fields; G IN-OUT; Meta-distance.