

Accepted Manuscript

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

Massimo Buscema, Giulia Massini, Pier Luigi Sacco

PII: S0378-4371(17)30942-1
DOI: <https://doi.org/10.1016/j.physa.2017.09.050>
Reference: PHYSA 18655

To appear in: *Physica A*

Received date: 19 April 2017

Please cite this article as: M. Buscema, G. Massini, P.L. Sacco, The Topological Weighted Centroid (TWC): A topological approach to the time-space structure of epidemic and pseudo-epidemic processes, *Physica A* (2017), <https://doi.org/10.1016/j.physa.2017.09.050>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



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

Massimo Buscema*

Semeion Research Center, Rome, Italy

Dept of Mathematical and Statistical Sciences, University of Colorado Denver, USA

**Corresponding Author: m.buscema@semeion.it*

Giulia Massini

Semeion Research Center, Rome, Italy

Pier Luigi Sacco

IULM University Milan, Italy

Harvard University, Cambridge MA USA

metaLAB (at) Harvard, Cambridge MA USA

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.

Download English Version:

<https://daneshyari.com/en/article/7376368>

Download Persian Version:

<https://daneshyari.com/article/7376368>

[Daneshyari.com](https://daneshyari.com)