

Generalized Conley Index Theory via Covering Action on Invariant Sets

Mariana Rodrigues da Silveira

Universidade Federal do ABC

In this work, we apply Conley index theory in a regular covering space of an invariant set S , possibly not isolated, in order to describe the dynamics in S . More specifically, we consider the action of the covering translation group in order to define a topological separation of S which distinguishes the connections between the Morse sets within a Morse decomposition of S . This theory generalizes the classical connection matrix theory, since more detailed information is extracted from the connection maps. Moreover, in the case of a pullback flow on the infinite cyclic covering induced by a circle-valued Morse function f , we prove that the Novikov differential of f is a particular case of the p -connection matrix.

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