CONLEY THEORY FOR GUTIERREZ-SOTOMAYOR FLOWS

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We start this work by studying isolated invariant sets S within a continuous flow φ on a topological space X. In order to investigate the local and global dynamics we consider the **Conley index** of S. This definition is related to the existence of an index pair (N_1, N_0) for S, because **homotopy Conley index** of S is the homotopy type of the pointed space $(N_1/N_0, [N_0])$ and denoted by $\mathbf{h}(\mathbf{S})$. We prove that an index pair always exists, and given two index pairs for S, they are always homotopic, hence, the homotopy Conley index is well defined. We can also define the **homology Conley index** of S as $\mathbf{CH}_*(\mathbf{S}) := \mathbf{H}_*(\mathbf{h}(\mathbf{S}))$, where H_* denotes the singular homology over $\mathbb{Z}$, and the **numerical Conley indices** of S are defined as the rank of the homology Conley index of S, and denoted for $\mathbf{h}_*(\mathbf{S}) := \mathbf{rankCH}_*(\mathbf{S})$.

After an introduction to Conley theory, we enter into the universe of **Gutierrez-Sotomayor manifolds** or, as we use to say **GS manifolds**, which are singular two manifolds with simple singularities. We also define the notion of **GS flow**. Finally, we can approach at our central goal, relating these two theories. We are able to compute the Conley index of singularities of a given GS flow.

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References

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