Abstract:
Let K be a closed connected k-manifold, $0 \leq k \leq n-1$. A subset B in the n-manifold M^n is K-*contractible* (in M) if there are maps $\varphi : B \longrightarrow K$ and $\alpha : K \longrightarrow M^n$ such that the inclusion map $i : B \longrightarrow M^n$ is homotopic to $\alpha \cdot \varphi$. The K-*category* $cat_K M$ of M is the smallest number of sets, open and K-contractible needed to cover M. For K a point P we obtain the classical Lusternik-Schnirelman category $cat\, M = cat_P M$. We are interested here in the case $K = S^1$. We give some examples and discuss recent results.