I Workshop de Teses e Dissertações em Matemática
ICMC - Instituto de Ciências Matemáticas e de Computação
USP - Universidade de São Paulo
December 1-2, 2011

DEGREE OF EQUIVARIANT MAPS BETWEEN GENERALIZED G-MANIFOLDS

NORBIL CORDOVA & DENISE DE MATTOS & EDIVALDO DOS SANTOS

Until 1930 Poincaré and Alexander duality theorems for integer coefficients had only been proved for orientable compact topological manifolds. Starting with Čech and Lefschetz in 1933 topologists endeavored to define classes of spaces by purely homological conditions which would include topological manifolds, and for which the duality theorems would hold.

By a n-dimensional generalized manifold is meant a locally compact Hausdorff space whose local homology or cohomology (depending on this, the space is called homology or cohomology manifold) coincides with the local homology or cohomology of n-dimensional euclidean space [7]. The proof of Poincaré duality for generalized manifolds with coefficients in any field is given in the paper of Borel [1]. Later in [3] Borel and Moore defined a special homology theory which allowed them with the aid of tools of homological algebra and the theory of sheaves to extend this result to arbitrary modules of coefficients (and even sheaves of modules) over principal ideal rings. Using the duality theorem, we can define the degree of continuous maps between generalized manifolds.

Generalized manifolds show up naturally in topological problems in the theory of transformation groups [2]. In [6], Yasuhiro Hara studied the degree of equivariant maps between free G-manifolds, where G is a compact Lie group, under certain conditions on them. His main results were proved in terms of the ideal-valued cohomological index due to Fadell and Husseini [5]. We are interested in extending these results, by replacing the free G-manifolds by free generalized G-manifolds over $\mathbb{Z}$.

References

[1] BOREL, A. - *The Poincaré duality in generalized manifolds*, Michigan Math. J. **4** (1957), 227–239.

[2] BOREL, A. - *Seminar on Transformation Groups*, Annals of Mathematics Study (1960).

[3] BOREL, A. AND MOORE, J. - *Homology theory for locally compact spaces.* Michigan Math. Journal, **7** (1960) 137–159.

[4] BREDON, G. - *Wilder manifolds are locally orientables.* Proc. Nat. Acad. Sci. U.S.A. **63** (1969), 1079–1081.

[5] FADELL, E. AND HUSEINI, S. - *An ideal-valued cohomological index theory with applications to Borsuk-Ulam and Bourgin-Yang theorems.* Ergodic Theory Dynam. Systems **8** (1988),Charles Conley Memorial Issue, 73–85.

[6] HARA, Y. - *The degree of equivariant maps*, Topology and its Applications, **148**, (2005), 113–121.

[7] WILDER, R - *Topology of Manifolds* Amer. Math. Soc. Colloq. Publ., vol.32, Amer. Math. Soc., Providence, R.I.,1949. (1963), pp. 5042-5044.