Roots for maps from a complex into a manifold

Thaís F. M. Monis
University of the State of São Paulo (UNESP), Brazil
(joint work with **D. L. Gonçalves and S. Spież**)

Let X, Y be topological spaces, $f : X \to Y$ a continuous map and $c \in Y$. The minimum number of roots is defined to be

$$MR[f;c] = \min \#\{g^{-1}(c) \mid g \sim f\},$$

where $g \sim f$ means g homotopic to f. In order to estimate $MR[f;c]$, a Nielsen number $N(f;c)$ is usually considered. In a general setting, the Nielsen number is geometrically defined and in more specific cases, for example, if X and Y are manifolds of same dimension, the Nielsen number can be defined homologically. In [1], Brown and Schirmer have re-established the connection between Nielsen root theory for maps between manifolds and the two concepts of degree - the geometric degree of a map and the Hopf's absolute degree. In the paper [3], Gonçalves studied the coincidence theory of a pair of maps (f, g) from a complex K into a compact manifold of same dimension by defining an index of a Nielsen coincidence class F. A particular case of such study is when the map g is a constant map and then we are in the direction of a Nielsen root theory for maps from a complex into a manifold of same dimension. In [4], we extended the notion of Hopf's absolute degree for maps between manifolds of same dimension to maps from a complex into a manifold of same dimension. In this talk, I intend to define such notion and to present some results concerning the study of the sets of deficient and multiple points of a map from a complex into a manifold.

References

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[4] Gonçalves, D. L., Monis, T. F. M., Spiez, S., *Deficient and multiple points of maps into a manifold.* (pre-print)