Seminário Júnior*
Universidade Federal do Rio de Janeiro, 2019

The CW-complex associated to a Morse and Morse-Smale functions

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Quinta-feira 04 de Abril - Sala C100a - Horário 13:10.

Abstract

We prove the cell equivalence theorem for Morse-Smale functions due to Franks [1]. Franks' results relate the unstable manifolds of a Morse-Smale function $f: M \to \mathbb{R}$ to the cells in the CW-complex determined by f, where (M, g) is a finite dimensional compact smooth Riemannian manifold. For the proof we use the $\lambda-$ lemma proved by Palis in [3]. We also show an analogous result for a Morse function $f: M \to \mathbb{R}$ assuming two lemmas due to Whitehead [4] and Hilton [2].

References

[1] Franks, J.M. Morse-Smale flows and Homotopy theory. Topology **18**, 199-215,(1979).

[2] Milnor J., *Morse theory*, Princeton University Press, Princeton, N.J., 1963.

[3] Palis, J. On Morse-Smale dynamical system. Topology **8**, 385-404,(1968).

[4] Whitehead J. H. C. On simply connected, 4-dimensional polyhedra. Comment. Math. Helv. **22**, 48-92, (1949).

*Todas as quartas. Hora: 10:10 - Sala: C100a.