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The action of the modified gradient flow on the sublevel sets of some smooth functions

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Abstract

The gradient flow of a bounded smooth function defined on a complete Riemannian manifold, which satisfies the Palais-Smale condition, is a one parameter semigroup. It pushes the regular sublevel sets down into regular sublevel sets, but doesn't generally permutes the regular level sets. However the flow of a slightly modified gradient vector field becomes a one-parameter group of diffeomorphisms which permutes the regular level sets. In this talk we try to embed the two and three dimensional unit balls within the evolution of some regular sublevel sets under the action of the modified gradient flow.