

Abstract

On The Goresky-Hingston Product

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In [GH09] M. Goresky and N. Hingston described and investigated various properties of a product on the cohomology of the free loop space of a closed, oriented manifold M relative to the constant loops. In this thesis we will give Morse and Floer theoretic descriptions of the product. There is a theorem due to J. Jones in [JJ87] which describes an isomorphism between cohomology of the free loop space and Hochschild homology of the singular cochain algebra of M with rational coefficients. We will use the theorem of J. Jones to find an algebraic model for the Goresky-Hingston product. We then use the algebraic model to explore further properties and applications of the Goresky Hingston product. In particular we use it to compute the ring structure for the n -spheres.

Keywords

String topology, Goresky-Hingston product, Morse theory, Floer homology, Hochschild homology