A combinatorial description of the Heegaard Floer contact invariant

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Algebraic & Geometric Topology 7 (2007) 1201–1209
DOI: 10.2140/agt.2007.7.1201
arXiv: math.GT/0612322

Abstract

We observe that the Heegaard Floer contact invariant is combinatorial by applying the algorithm of Sarkar-Wang to the description of the contact invariant due to Honda-Kazez-Matić. We include an example of this combinatorial calculation.

Keywords

contact structures, open book decomposition, Heegaard Floer homology

Mathematical Subject Classification 2000

Primary: 57R17
Secondary: 57R58

References

Publication

Received: 28 May 2007
Accepted: 22 July 2007
Published: 24 September 2007

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Combinatorial Heegaard-Floer invariants for four-dimensional cobordisms. Hat Heegaard Floer theory assigns a nitely generated abelian group to each three-manifold, and a group homomorphism to each (decorated) four-dimensional cobordism. The corresponding hat invariants for closed 4-manifolds are trivial, but for 4-manifolds with boundary they are strong enough to detect exotic smooth structures. Sarkar and Wang gave a combinatorial description of the hat invariant for any 3-manifold. I will talk about joint work with Lipshitz and Wang, in which we described combinatorially the hat invariant. This invariant is nonzero for Stein-fillable contact structures, and vanishes for overtwisted ones. In this collection of talks, I plan to discuss some of the basic definitions in Heegaard Floer homology and explain how one might use it to find new tight contact 3-manifolds.

October. « » S.

How to get to Penn's Mathematics Department.
The Mathematics Department Office is located on the fourth (top) floor of David Rittenhouse Laboratory ("DRL"). The building is at 209 South 33rd Street (the Southeast corner of 33rd and Walnut Streets). Note 33rd Street runs one way north while Walnut runs one way west. The simplest version of Heegaard Floer homology associates to Y a nitely generated Abelian PO was partially supported by NSF Grant Number DMS 0234311. ZSz was partially supported by NSF Grant Number DMS 0107792. A similar example is given by taking a tubular neighborhood of the unknot in S3. Since the complement is also a solid torus, we get a genus 1 Heegaard decomposition of S3, giving a trivial hat invariant. 

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