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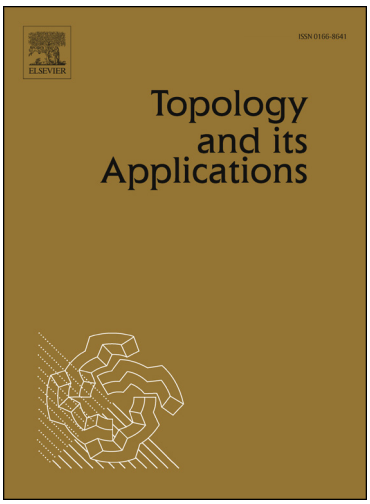

On intersection forms of definite 4-manifolds bounded by a rational homology 3-sphere

Dong Heon Choe, Kyungbae Park

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ACCEPTED MANUSCRIPT

On intersection forms of definite 4-manifolds bounded by a rational homology 3-sphere

Dong Heon Choe

Department of Mathematical Science, Seoul National University, Seoul 08826, Republic of Korea

Kyungbae Park*

School of Mathematics, Korea Institute for Advanced Study, Seoul 02455, Republic of Korea

Abstract

We show that, if a rational homology 3-sphere Y bounds a positive definite smooth 4-manifold, then there are finitely many negative definite lattices, up to the stable-equivalence, which can be realized as the intersection form of a smooth 4-manifold bounded by Y. To this end, we make use of constraints on definite forms bounded by Y induced from Donaldson's diagonalization theorem, and correction term invariants due to Frøyshov, and Ozsváth and Szabó. In particular, we prove that all spherical 3-manifolds satisfy such finiteness property.

Keywords: Smooth 4-manifolds, intersection forms, spherical 3-manifolds, integral lattices
2010 MSC: 57M27, 57N13, 57R58

1. Introduction

Throughout this paper we assume that all manifolds are compact and oriented. We say a 4-manifold X *is bounded by* a 3-manifold Y if Y is

*Corresponding author.
Email addresses: honey8276@snu.ac.kr (Dong Heon Choe), kbpark@kias.re.kr (Kyungbae Park)

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