



# Splitting of 3-Manifolds and Rigidity of Area-Minimising Surfaces

Mario Micalef, Vlad Moraru

(Submitted on 26 Jul 2011 (v1), last revised 4 Aug 2011 (this version, v3))

In this paper we prove an area comparison result for certain totally geodesic surfaces in 3-manifolds with a lower bound on the scalar curvature. This result is a variant of a comparison theorem of Heintze-Karcher for minimal hypersurfaces in manifolds of nonnegative Ricci curvature. Our assumptions on the ambient manifold are weaker but the assumptions on the surface are considerably more restrictive. We then use our comparison theorem to provide a unified proof of various splitting theorems for 3-manifolds with lower bounds on the scalar curvature.

Comments: We fixed an error which occurred during the upload of the second version of the paper

Subjects: **Differential Geometry (math.DG)**

Cite as: [arXiv:1107.5346](#) [math.DG]

(or [arXiv:1107.5346v3](#) [math.DG] for this version)

## Submission history

From: Vlad Moraru [[view email](#)]

[v1] Tue, 26 Jul 2011 22:11:27 GMT (8kb)

[v2] Wed, 3 Aug 2011 14:41:47 GMT (9kb)

[v3] Thu, 4 Aug 2011 22:44:45 GMT (8kb)

*[Which authors of this paper are endorsers?](#)*

Link back to: [arXiv](#), [form interface](#), [contact](#).

## Download:

- [PDF](#)
- [PostScript](#)
- [Other formats](#)

Current browse context:

math.DG

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1107](#)

Change to browse by:

[math](#)

## References & Citations

- [NASA ADS](#)

Bookmark([what is this?](#))

