

An improvement of dimension-free Sobolev imbeddings in r.i. spaces

Alberto Fiorenza*,
Miroslav Krbec†,
and Hans-Jürgen Schmeisser‡

Abstract

We prove a dimension-invariant imbedding estimate for Sobolev spaces of first order, and we establish a kind of optimality.

Keywords: Sobolev space, imbedding theorem, small Lebesgue space, logarithmic Lebesgue space, rearrangement-invariant Banach function space

2000 Mathematics Subject Classification: Primary 46E35; Secondary 46E30

*Dipartimento di Architettura, Università di Napoli, Via Monteoliveto, 3, I-80134 Napoli, Italy, and Istituto per le Applicazioni del Calcolo “Mauro Picone”, sezione di Napoli, Consiglio Nazionale delle Ricerche, via Pietro Castellino, 111, I-80131 Napoli, Italy (fiorenza@unina.it)

†This paper had to be finished during the visit of the first author to the Institute of Mathematics in Praha, from June, 25 until July, 5 2012, but the second author suddenly passed away on June, 17. The present version contains the work made by the coauthors during such visit. The first author wishes to thank Šárka Nečasová and the Institute for the kind hospitality, partially supported by the Grant Agency of the Czech Republic under no. 201/10/1920 and RVO 67985840

‡Mathematisches Institut, Fakultät für Mathematik und Informatik, Friedrich-Schiller-Universität, Ernst-Abbe-Platz 1-2, 07743 Jena, Germany (mhj@uni-jena.de)