

Preface

While preparing this volume, I was encouraged to present the details of three new claims that I have made concerning Morrey Spaces and the action of Riesz potential operators on these spaces. The claims all follow from a new formulation of the predual to a Morrey Space (2012): $H^{p',\lambda}(\mathbb{R}^n)$; see Chapter 5, a version that generally meets all the desired requirements for such in Harmonic Analysis. The full theory is presented here for the first time. These include:

- (1) Determine the integrability classes of the trace of a Riesz potential of an arbitrary Morrey function, in the unbounded case. The key idea here is the existence of certain Wolff potentials; see Chapter 10.
- (2) Determine the capacity of the singular sets (sets of discontinuities) of weak solutions of a $2m$ th-order quasilinear elliptic systems, with m th-order derivatives belonging to L^p , e.g., the celebrated Meyers-Elcrat system. Here the m th-order derivatives can be upgraded to belong to a Morrey class; see Chapters 15 and 16.
- (3) Are there any “full” interpolation results for linear operators between Morrey Spaces in the light of the now known counterexamples in the literature? I claim that there are - with important restrictions. For this we refer the reader to Chapter 11. This all depends on an atomic decomposition of a Morrey Space and a full use of our duality of Chapter 5.

Lexington, KY, USA
July 2014

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Morrey Spaces

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2015, XVII, 124 p. 1 illus. in color., Softcover

ISBN: 978-3-319-26679-4

A product of Birkhäuser Basel