

MEMOIRS

of the
American Mathematical Society

Number 713

Layer Potentials, the Hodge Laplacian, and Global Boundary Problems in Nonsmooth Riemannian Manifolds

Dorina Mitrea
Marius Mitrea
Michael Taylor



March 2001 • Volume 150 • Number 713 (fourth of 5 numbers) • ISSN 0065-9266

American Mathematical Society
Providence, Rhode Island

Contents

Introduction	1
Chapter 1. Singular integrals on Lipschitz submanifolds of codimension one	6
Chapter 2. Estimates on fundamental solutions	12
Chapter 3. General second-order strongly elliptic systems	27
Chapter 4. The Dirichlet problem for the Hodge Laplacian and related operators	39
Chapter 5. Natural boundary problems for the Hodge Laplacian in Lipschitz domains	45
Chapter 6. Layer potential operators on Lipschitz domains	54
Chapter 7. Rellich type estimates for differential forms	60
Chapter 8. Fredholm properties of boundary integral operators on regular spaces	64
Chapter 9. Weak extensions of boundary derivative operators	71
Chapter 10. Localization arguments and the end of the proof of Theorem 6.2	77
Chapter 11. Harmonic fields on Lipschitz domains	84
Chapter 12. The proofs of the Theorems 5.1–5.5	91
Chapter 13. The proofs of the auxiliary lemmas	98
Chapter 14. Applications to Maxwell's equations on Lipschitz domains	104
Appendix A. Analysis on Lipschitz manifolds	108
Appendix B. The connection between d_{∂} and $d_{\partial\Omega}$	113
Bibliography	117