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			DUPLICATES	1830

doc_1

authors	• Piazza, Paolo
title	K-theory and index theory on manifolds with boundary
publication_date	1991-01-01 00:00:00
source	SupportedSources.CORE
journal	
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doi	None
urls	• https://core.ac.uk/download/4396412.pdf
id	id-2429163021162848562
abstract	Thesis (Ph. D.)--Massachusetts Institute of Technology, Dept. of Mathematics, 1991.Includes bibliographical references (leaves 95-96).by Paolo Piazza.Ph.D
versions	

doc_2

authors	• Paolo Piazza
title	K-theory and index theory on manifolds with boundary
publication_date	None
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doi	
urls	• https://www.semanticscholar.org/paper/bee9e69240ee773da9a9f8269373d41d5d3131f6
id	id-7330014701028106543
abstract	Let X be a manifold with corners and denote by M 1 (X) the set of boundary hypersurfaces in X. If D C M 1 (X) then, by using the calculus of b-pseudodifferential operators, we define quantization maps from the K-cohomology groups K*(T*X, T*X ID) to the analytic K-homology groups K*(X, CD), where CD = nM (X)\D. We prove that these maps are always isomorphisms realizing Poincar6 duality. We then specialize to manifolds with boundary where we extend various results of Atiyah, Patodi and Singer. First we study the asymmetry of the boundary spectrum of an elliptic b-pseudodifferential operator, A, by introducing an appropriate eta function and investigating its meromorphic properties; in particular we prove that s = 0, an a priori pole, is a regular point. Next we connect the boundary spectral asymmetry of the operator A to its index as a Fredholm map between r-weighted Sobolev spaces; thus we express the index as the sum of the value at s = 0 of the eta function described above and the value at s = 0 of the difference of the b-zeta functions associated to A*A and AA* respectively: indr(A) =-r(O, I(A)) + b((A*A)-b((AA*) For generalized Dirac operators this formula gives the Atiyah-Patodi-Singer index theorem. ACKNOWLEDGEMENTS It is a pleasure to thank my thesis advisor, Richard Melrose, for everything he has taught me and for many important suggestions that greatly improved this thesis. I also thank him for his enthusiasm, wisdom and good humor: I indeed feel privileged to have had such a distinguished mentor. I acknowledge interesting and enlightening discussions on the matter of this thesis with : Mazzeo. I especially thank my friend Siye Wu for so many pleasent conversations and for our collaboration on automorphisms of current algebras. I thank all the people in the Department of Mathematics of M.I.T. for creating such a stimulating environment. The financial support of the Consiglio Nazionale delle Ricerche in Italy and of M.I.T. is also gratefully acknowledged. I heartly thank Cathy Cassety for her love, companionship and support. My deepest gratitude goes to my parents, Maria Pia and Giorgio Piazza. This work is dedicated to them.
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