
Contents

1	Background on Symplectic Spinors	1
1.1	Symplectic Group and Clifford Algebra	1
1.2	The Stone–von Neumann Theorem	5
1.3	Metaplectic Representation	7
1.4	Symplectic Clifford Multiplication	11
1.5	Hermite Functions	16
2	Symplectic Connections	21
2.1	Symplectic Manifolds	21
2.2	Constructions and Torsion	25
2.3	Symplectic Curvature and Ricci Tensors	29
3	Symplectic Spinor Fields	35
3.1	Metaplectic Structures	35
3.2	Symplectic Spinor Bundle	37
3.3	Splitting of the Spinor Bundle	43
4	Symplectic Dirac Operators	49
4.1	Definition of the Operators	49
4.2	Dependence on the Symplectic Connection	52
4.3	Dependence on the Metaplectic Structure	57
4.4	Dependence on the Almost Complex Structure	62
4.5	Formal Self-Adjointness	64

5	An Associated Second Order Operator	67
5.1	Definition and Ellipticity	67
5.2	A Weitzenböck Formula	68
5.3	Splitting of the Operator	74
6	The Kähler Case	81
6.1	The Operator \mathcal{P} on Kähler Manifolds	81
6.2	Lower Bound Estimates	86
6.3	The Spectrum of \mathcal{P} on $\mathbb{C}P^1$	87
7	Fourier Transform for Symplectic Spinors	97
7.1	Definition of the Transform	97
7.2	Basic Properties	98
7.3	Symmetry of the Spectra of \mathcal{D} and $\tilde{\mathcal{D}}$	99
8	Lie Derivative and Quantization	101
8.1	Lie Derivative of Symplectic Spinor Fields	101
8.2	Schrödinger Equation for Quadratic Hamiltonians	109
8.3	Lie Derivative as Quantization	111
	References	115
	Index	119

Introduction to Symplectic Dirac Operators

Habermann, K.; Habermann, L.

2006, XII, 125 p. With online files/update., Softcover

ISBN: 978-3-540-33420-0