

Contents

Introduction	11
1 Krein Spaces	15
1.1 The Geometry of Krein Spaces	15
1.2 Operators in Krein Spaces	17
1.3 Operators with Finitely Many Negative Squares	19
2 Boundary Triplets and Related Classes of Functions	23
2.1 Boundary Triplets, Weyl Functions, and γ -Fields	23
2.2 Boundary Triplets, Weyl Functions, and Rank One Perturbations	27
2.3 Rank One Perturbations and Interlacing of Eigenvalues	30
2.4 Realisation of Weyl Functions	36
3 Finite Rank Perturbations of Root Subspaces	49
3.1 Root Subspaces under Finite Rank Perturbations	49
3.2 Root Subspaces at Real Points under Rank One Perturbations	58
4 Root Subspaces of Non-negative Operators	63
4.1 Root Subspaces at $\mu = 0$	63
4.2 Root Subspaces at $\mu \neq 0$	73
5 Spectral Intervals under Rank One Perturbations	79
5.1 $\mathcal{D}_0$ - and $\mathcal{D}_1$ -Functions	79
5.2 Total Number of Eigenvalues in an Interval	87
5.3 Total Multiplicity of Eigenvalues in an Interval	99
6 Conclusions	105
Bibliography	111