

CONTENTS

I. INTRODUCTION	1
I.1. Introduction	2
I.2. Summary of the work	10
II. PERTURBATION THEORY FOR LINEAR OPERATORS	15
II.1. Introduction	16
II.2. Definitions	17
II.3. Degeneracy of Eigenvalues	23
II.4. Divergence of Energy Series	27
III. ANALYTICITY IN COUPLING CONSTANTS BY THE THEORY OF LINEAR OPERATORS	32
III.1. Introduction	33
III.2. The spectrum	35
III.2.1. Holomorphic family of operators	35
III.2.2. The scaling law	42
III.2.3. Perturbation expansion	44
III.3. First-sheet Analyticity	45
III.4. Conclusion	51

IV.	ANGULAR MOMENTUM ANALYTICITY	53
IV.1.	Introduction	54
IV.2.	The GM Technique	56
IV.3.	The Hilbert space Approach	65
IV.3.1.	Potential with a linear dominant term.	65
IV.3.2.	Potential with an arbitrary dominant term	79
IV.3.3.	Extension to arbitrary number of terms	84
IV.4.	Conclusion	86
	APPENDIX	87
	Uniform convergence of an Integral	88
	References.	91