Preface


It was initially published as the Kyushu University COE Lecture Note number 8 (COE Lecture Note, 8. Kyushu University, The 21st Century COE Program “DMHF”, Fukuoka, 2008. vi+234 pp.), and in the present form is an extended version of it (in particular, I have added a section dedicated to the Maslov index).

The book is intended as a rapid (though not so straightforward) pseudodifferential introduction to the spectral theory of certain systems, mainly of the form $a_2 + a_0$ where the entries of $a_2$ are homogeneous polynomials of degree 2 in the $(x, \xi)$-variables, $(x, \xi) \in \mathbb{R}^n \times \mathbb{R}^n$, and $a_0$ is a constant matrix, the so-called non-commutative harmonic oscillators, with particular emphasis on a class of systems introduced by M. Wakayama and myself about ten years ago. The class of non-commutative harmonic oscillators is very rich, and many problems are still open, and worth of being pursued.

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