Spectral Asymptotics in the Semi-Classical Limit

Mouez Dimassi
Université de Paris-Nord

Johannes Sjöstrand
École Polytechnique
## Contents

0. Introduction vii

1. Local symplectic geometry 1

2. The WKB-method 11

3. The WKB-method for a potential minimum 17

4. Self-adjoint operators 27

5. The method of stationary phase 43

6. Tunnel effect and interaction matrix 49

7. h-pseudodifferential operators 75

8. Functional calculus for pseudodifferential operators 93

9. Trace class operators and applications of the functional calculus 111

10. More precise spectral asymptotics for non-critical Hamiltonians 119

11. Improvement when the periodic trajectories form a set of measure 0 125

12. A more general study of the trace 139

13. Spectral theory for perturbed periodic problems 155

14. Normal forms for some scalar pseudodifferential operators 189

15. Spectrum of operators with periodic bicharacteristics 201

References 209

Index 221

Index of notation 226