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   Autore   Nakamura Hiroki

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   Nota di contenuto   ch. 1. Introduction: what is "nonadiabatic transition"? -- ch. 2. Multi-disciplinarity. 2.1. Physics. 2.2. Chemistry. 2.3. Biology. 2.4. Economics -- ch. 3. Historical survey of theoretical studies. 3.1. Landau-Zener-Stueckelberg theory. 3.2. Rosen-Zener-Demkov theory. 3.3. Nikitin's exponential model. 3.4. Nonadiabatic transition due to Coriolis coupling and dynamical state representation -- ch. 4. Background mathematics. 4.1. Wentzel-Kramers-Brillouin semiclassical theory. 4.2. Stokes phenomenon -- ch. 5. Basic two-state theory for time-independent processes. 5.1. Exact solutions of the linear curve crossing problems. 5.2. Complete semiclassical solutions of general curve crossing problems. 5.3. Non-curve-crossing case. 5.4. Exponential potential model. 5.5. Mathematical implications -- ch. 6. Basic two-state theory for time-dependent processes. 6.1. Exact solution of quadratic potential problem. 6.2. Semiclassical solution in general case. 6.3. Other exactly solvable models -- ch. 7. Two-state problems. 7.1. Diagrammatic technique. 7.2. Inelastic scattering. 7.3. Elastic scattering with resonances and predissociation. 7.4. Perturbed bound states. 7.5. Time-dependent periodic crossing problems -- ch. 8. Effects of dissipation and fluctuation -- ch. 9. Multi-channel problems. 9.1. Exactly solvable models. 9.2. Semiclassical theory of time-independent multi-channel problems. 9.3. Time-dependent problems -- ch. 10. Multi-dimensional problems. 10.1. Classification of surface crossing. 10.2. Reduction to one-dimensional multi-channel problem. 10.3.

Semiclassical propagation method -- ch. 11. Complete reflection and bound states in the continuum. 11.1. One NT-type crossing case. 11.2. Diabatically avoided crossing (DAC) case. 11.3. Two NT-type crossings case -- ch. 12. New mechanism of molecular switching. 12.1. Basic idea. 12.2. One-dimensional model. 12.3. Two-dimensional model. 12.4. Numerical examples -- ch. 13. Control of nonadiabatic processes by an external field. 13.1. Control of nonadiabatic transitions by periodically sweeping external field. 13.2. Basic theory. 13.3. Numerical examples. 13.4. Laser control of photodissociation with use of the complete reflection phenomenon -- ch. 14. Conclusions: future perspectives.

| Sommario/riassunto | An exploration of the concepts, basic theories and applications of nonadiabatic transition. Nonadiabatic transition is a multidisciplinary concept and phenomenon, constituting a fundamental mechanism of state and phase changes in various dynamical processes of physics, chemistry and biology. |