# Exact semiclassical expansions for one-dimensional quantum oscillators

Submitted by Eric Delabaere on Tue, 03/03/2015 - 21:30

| | |
|---|---|
| Titre | Exact semiclassical expansions for one-dimensional quantum oscillators |
| Type de publication | Article de revue |
| Auteur | Delabaere, Eric [1], Dillinger, Hervé [2], Pham, Frédéric [3] |
| Editeur | American Institute of Physics |
| Type | Article scientifique dans une revue à comité de lecture |
| Année | 1997 |
| Langue | Anglais |
| Date | 1997 |
| Numéro | 12 |
| Pagination | 6126–6184 |
| Volume | 38 |
| Titre de la revue | Journal of Mathematical Physics |
| ISSN | 0022-2488 |
| Résumé en anglais | A set of rules is given for dealing with WKB expansions in the one-dimensional analytic case, whereby such expansions are not considered as approximations but as exact encodings of wave functions, thus allowing for analytic continuation with respect to whichever parameters the potential function depends on, with an exact control of small exponential effects. These rules, which include also the case when there are double turning points, are illustrated on various examples, and applied to the study of bound state or resonance spectra. In the case of simple oscillators, it is thus shown that the Rayleigh–Schrödinger series is Borel resummable, yielding the exact energy levels. In the case of the symmetrical anharmonic oscillator, one gets a simple and rigorous justification of the Zinn-Justin quantization condition, and of its solution in terms of "multi-instanton expansions |
| URL de la notice | http://okina.univ-angers.fr/publications/ua8549 [4] |
| DOI | 10.1063/1.532206 [5] |
| Lien vers le document | http://dx.doi.org/10.1063/1.532206 [5] |

**Liens**

[1] http://okina.univ-angers.fr/e.delabaere/publications
[2] http://okina.univ-angers.fr/publications?f[author]=15157
[3] http://okina.univ-angers.fr/publications?f[author]=15156
[4] http://okina.univ-angers.fr/publications/ua8549
[5] http://dx.doi.org/10.1063/1.532206

Publié sur *Okina* (http://okina.univ-angers.fr)