DK Seminar

December 2, 2015, 14:15 - 15:45
University of Vienna
Oskar-Morgenstern-Platz 1, HS 2.

Kirian Döpfner

Vienna University of Technology

Efficient approximation-schemes for highly oscillating differential equations including turning points

We are concerned with the highly oscillatory regime of a stationary Schrödinger equation including so-called turning points, i.e. zeros of the coefficient function. The numerical integration of a highly oscillating differential equation demands high computational cost. To avoid that, we use a hybrid method. First an Airy function-ansatz is used to transform the ODE hence to eliminate the dominant oscillations. This ODE can then be solved using asymptotic expansions, which yields an asymptotically correct scheme that is first order consistent with no necessity for a fine spatial grid.