
SEMICLASSICAL ANALYSIS OF A PROBLEM WITH A CIRCULAR WELL

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In joint work with San Vũ Ngọc we study classical and quantum systems with one degree of freedom, for which the energy profile (defined on a surface) reaches its minimum on a closed curve. A typical example is a massive particle moving on a circle and subject to a magnetic field. The quantum version of such problems is, in particular, useful as an effective model for studying magnetic fields in several degrees of freedom, and we exhibit an oscillation phenomenon for small eigenvalues, similar to the "Little-Parks" in superconductors.

In this talk, I will show how to "solve" the classical problem, that is, find good coordinates which simplify it: Then I will discuss the quantum version of this simplification, and notably the origin of these oscillations.

This talk is, hopefully, accessible without any particular knowledge of semiclassical analysis.