סמינר מיוחד בכימיה פיסיקלית ותאורטית

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נושא:

TIME REVERSAL SYMMETRY IN QUANTUM MECHANICS

ההרצאה תתקיים בחדר סמינרים של המכון ללימודים מתקדמים
בכימיה תאורטית (בפקולטה לכימיה, קומה 2)

Time reversal symmetry in quantum mechanics

This talk provides a pedagogical introduction of the concept of time reversal in quantum mechanics. We begin with an exploration of the time reversal of dynamics governed by the Hamiltonian H = T + V (where T is the usual kinetic operator, and V is the usual potential operator of an N-particle system). We introduce an antiunitary operator facilitating the time reversal transformation, and prove that the time reversal does represent a symmetry of H = T + V. Subsequently, we discuss explicitly time reversal symmetry of the scattering T-matrix elements, and derive the corresponding equation of detailed balance. Implications of the time reversal symmetry for bound state problems are also mentioned briefly. Finally, we consider Hamiltonians which include an external magnetic field. We show that such Hamiltonians violate the time reversal symmetry, hence the equation of detailed balance does not apply. This is a pedagogical talk, based upon [1].

[1] J. J. Sakurai, Modern Quantum Mechanics (Revised Edition), Addison-Wesley (1994), Sections 4.4 and 7.10.