Faculdade de Ciências da Universidade de Lisboa
cmafcio@fc.ul.pt Tel. (+351) 21 750 00 27

SEMINÁRIO DE ANÁLISE ESTOCÁSTICA E FÍSICA MATEMÁTICA

Dia 17 de Março (quinta-feira), às 13H30, na sala 6.2.33

Correlations in qudits as a resource for quantum technologies

Margarita A. Man'ko and Vladimir I. Man'ko

(Lebedev Physical Institute, Moscow)

Abstract:

New entropic inequalities are discussed for single qudit systems (spin states). In particular, the subadditivity condition known for bipartite quantum systems and the strong subadditivity condition known for tripartite quantum systems are shown to exist for the states of noncomposite quantum systems. A new entropy -energy uncertainty relation with a bound determined by the partition function is discussed for an arbitrary set of qudits (set of spin particles). Bell inequality and its violation known, e.g., for two qubits (two spin-1/2 particles) are shown to exist for a single spin j=3/2 particle. Discussion of quantum correlations (hidden correlations) is presented. Application to artificial atom states in superconducting circuits based on Josephson junctions is considered. The hidden quantum correlations are discussed for possible applications in quantum technologies.

M.A. Man'ko and V.I. Man'ko, Entropy, Vol. 17, p. 2876 (2015).
M.A. Man'ko and V.I. Man'ko, Journal of Russian Laser Research, Vol. 37, p. 1 (2016).

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