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 16 de Março (quarta-feira), às 11H00, na sala 6.2.33

Contractions and deformations: Quantum-to-classical and classical-to-quantum

Vladimir I. Man'ko

(Lebedev Physical Institute, Moscow)

Abstract:

The construction of structure constants of associative products of functions in terms of pairs of operator families acting in a Hilbert space and called quantizer and dequantizer operators, respectively, is demonstrated. The Moyal product of Weyl symbols of the operators, which are the functions in the phase space, is reconsidered in terms of the presented construction. The invertible map of the quantum-state density operators onto the probability distributions (tomographic map) expressed in terms of the tomographic quantizer-dequantizer is given, and the kernel of the associative products of the operator tomographic symbols is obtained in an explicit form. The procedure for obtaining new kernels of star-products based on nonlinear transforms of the fiducial kernel is developed, and the example of Gronewald kernel of Moyal associative product of functions in the phase space is considered as another quantization version. The large mass limit of Moyal product is discussed and hybrid quantum-classical description of light and heavy particle systems is formulated. The quantum-to-classical transition is discussed.

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