MP 4: Quantentheorie und Quantisierung 1

Zeit: Dienstag 16:00–17:00 Raum: M010

MP 4.1 Di 16:00 M010

Berry Keating Operator on Graphs — •Sebastian Endres und Frank Steiner — Institut für Theoretische Physik Ulm, Albert Einstein Alle 11, 89081 Ulm

Berry und Keating untersuchten semiklassisch den Operator zur Hamilton-Funktion H=xp, da sie einen Zusammenhang vermuteten zwischen den Nullstellen der Riemann-Zeta Funktion und den Eigenwerten dieses Operators.

Sie schlugen vor, die Weylquantisierung von xp auf Graphen zu untersuchen. Im Vortrag soll

-der Berry-Keating Operator auf Graphen vorgestellt werden,

-eine Säkular Gleichung, eine Spurformel und das Weyl'sche Gesetzt für alle selbstadjungierten Realisierungen dieses Operators präsentiert werden,

-der Zusammenhang zum "normalen" Impulsoperator bzw. negativen Laplace-Operator (Quanten-Graphen) dargelegt werden.

MP 4.2 Di 16:20 M010

Der Zusammenhang zwischen mathematischer und physikalischer Verschränktheit — •Thomas Krüger — Institut für Chemie, Karl-Franzens-Universität Graz, Heinrichstraße 28, 8010 Graz, Österreich

Within the framework of a statistical interpretation of quantum mechanics entanglement (in a mathematical sense) manifests itself in the non-separability of the statistical operator ρ representing the ensemble in question. In experiments, on the other hand, entanglement can be detected, in the form of non-locality, by the violation of Bell's inequality $\Delta \leq 2$. How do these different viewpoints match? We employ a corrected von Neumann entropy to measure the (mathematical) degree of entanglement and show that, at least in the case of 2×2 dimensions, this function is directly related to Bell's correlation function Δ. This relation can be well approximated by an ellipse equation which, for the first time, allows for a direct comparison of the two faces of entanglement.

MP 4.3 Di 16:40 M010

Schwinger's variational principle in a modified form — •Mario Kieburg — Universität Duisburg-Essen, Lotharstraße 1, 47048 Duisburg

Schwinger's variational principle is a quantum field variational principle. Contrary to the canonical Dirac-quantization or Feynman's path-integral quantization, the starting point of describing a quantum system does not lie in a classical field theory. One gets both, the field equations and the commutation relations, by varying the expectation value of the action which is an operator on a Hilbert space.

Almost all quantum theories depend on the choice of the space-time foliation which is deeply connected with the distinction of a time. The original Schwinger variational principle is also of this type. We will present a modification of Schwinger's variational principle using the bundle formalism to make this principle covariant under the change of hypersurfaces in the space-time.