

# Seminar

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## Self-adjointness and bounded systems in quantum theory

Wednesday, August 3, 2022

at 15:30 h

ESI, Boltzmann Lecture Hall

**Abstract:** At present much attention is paid to the study of nonperturbative effects in quantum systems, arising as a consequence of interaction of quantized fields with various configurations of classical fields. Especial interest is to the investigation of the influence of configurations with nontrivial topology (kinks, vortices, monopoles, or, in general, topological defects) on the properties of quantum systems. There is a need, in this regard, to take account of the finite size of a topological defect and to set up a boundary condition on its edge. Our idea consists in the employment of the most general boundary conditions ensuring the impenetrability of quantum matter fields into the interior of a topological defect; in mathematical parlance, this means the condition of self-adjointness for the appropriate quantum-mechanical operator of energy. We set the task of discovering effects which are induced by a topological defect in general case in the ground state of quantum matter system. Further analysis and the requirement of physical plausibility of obtained results may restrict the ambiguity in the choice of boundary conditions. In this case, there is an opportunity of the unambiguous determination of effects which are induced by a topological defect in quantum matter.

C. Dellago

July 29, 2022