



Complex Variables in Quantum Gravity

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Message from the Guest Editor

Dear Colleagues,

This Special Issue is dedicated to the application of integral transformations to calculations of Green functions and scattering amplitudes in quantum gravity via the utilization of complex analysis, the Cauchy integral formula, the residue calculus technique and complex mapping. The Slavnov–Taylor identity relates different Green functions of quantum fields in gravity as well as in the Yang–Mills theory. In turn, the Slavnov–Taylor identity follows from the BRST symmetry of the classical action extended by certain additional terms. For the classical action, the BRST symmetry coincides with gauge symmetry. In gravitational theory, the gauge symmetry is represented by diffeomorphisms. The Green functions are defined in terms of the path integral whose measure is invariant with respect to BRST transformations. As a result of this BRST invariance, the Slavnov–Taylor identity appears in gravity.

Although the aim of this Special Issue is to publish original research articles on higher loop calculations in quantum gravity, focused on integral transformations involving complex variables, review articles on this subject are also welcome.

