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The infrared fixed point of Yang-Mills theories: A renormalization group analysis

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Abstract content

The infrared behavior of gluon and ghost propagators in Landau gauge Yang-Mills theory has been at the center of an intense debate over the last decade. Different solutions of the Dyson-Schwinger equations show a power law ("scaling solutions") or a massive behavior (for the gluons, "decoupling solutions") of the propagators in the infrared. The latest lattice results favor the decoupling solutions. In this talk, I will show how renormalization group equations of the Callan-Symanzik type in an epsilon expansion reproduce both types of solutions and single out the decoupling solutions as the infrared-stable ones for space-time dimensions greater than two, in agreement with the lattice calculations.

Summary

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