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Dispersive approach to QCD and hadronic contributions to electroweak observables

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The dispersive approach to QCD, which extends the applicability range of perturbation theory towards the infrared domain, is applied to the study of the hadronic vacuum polarization function and related quantities. This approach merges the intrinsically nonperturbative constraints, which originate in the kinematic restrictions on the relevant physical processes, with corresponding perturbative input. The obtained hadronic vacuum polarization function agrees with pertinent lattice simulation data. The evaluated hadronic contributions to the muon anomalous magnetic moment and to the shift of the electromagnetic fine structure constant conform with recent estimations of these quantities.

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