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The hadronic contribution to the electroweak couplings from Lattice QCD

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We present an *ab initio* determination of the QCD contribution to the electromagnetic coupling at the Z-pole and the weak mixing angle at low momentum exchange.
To compute the low momentum, non-perturbative QCD contribution to the running of both quantities, we employ a broad set of $N_f = 2 + 1$ Lattice QCD simulations with $O(a)$-improved Wilson fermions.
To connect our lattice results to the Z-pole, we employ the so-called Euclidean split technique, which relies on perturbation theory at high momentum and allows the computation of the time-like electromagnetic coupling from our space-like simulations.
Finally, we compare our results with several phenomenological determinations, which use the $e^+e^- \rightarrow$ hadrons cross-section data, and comment on the effect our determination has on the Higgs mass determined by the electroweak global fits of the Standard Model.

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