

Running constants: experimental evidence for the scale evolution of the strong coupling and quark massesle evolution of the strong coupling and quark masses (24+6)

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This review presents the current experimental evidence for the scale dependence of the parameters of the QCD Lagrangian. Ample evidence over a broad range of energy scales exists for the running of the strong coupling. I will review studies into the scale evolution of quark masses in more detail, with particular emphasis on the bottom quark, where Higgs data has helped to raise evidence for “running” of the mass to a significance greater than 5 sigma. I will discuss ongoing studies beyond the current state of the art and will present new directions and prospects at existing and future facilities.

This is meant to be a proper review, but leans heavily on IFIC contributions in PRL128 (2022) 12, J.Phys.G 51 (2024) 9, and Snowmass reports arXiv:2203.16994, arXiv:2209.11267

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