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Precise determinations of the strong coupling in lepton collisions

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We discuss the status of determinations of the strong coupling with special attention to using event shape observables based on data collected at the Large Electron Positron collider and theoretical predictions at highest accuracy available at present. We argue that such extractions can be competitive with lattice determinations if the observables are selected carefully such that both higher order perturbative as well as non-perturbative contributions are suppressed. We give a list of such observables and study one particular class–the soft groomed event shapes–in detail. We present predictions for the soft drop thrust and study the scale dependence as a function of the grooming parameters.

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