Contribution ID: **227**   Type: **not specified**

Alpha_s determination from the C-parameter distribution

Friday 12 September 2014 15:40 (20 minutes)

For the e+e- C-parameter we use soft-collinear effective theory to derive a factorization theorem, and then compute the cross section at N3LL + O(alphasˆ3). Differences with Thrust are highlighted. Our result holds for C in the peak, tail, and far tail regions, and we treat hadronization effects using a universal nonperturbative soft function defined in field theory. We analyze all available C-parameter tail data and obtain a global fit for alphas(mZ) and one nonperturbative parameter Omega1ˆC with chiˆ2/dof close to 1. These C-parameter results for alphas(mZ) and Omega1 are in excellent agreement with earlier results from thrust. Furthermore, for the first time we include hadron mass effects in the analysis of thrust and C-parameter experimental data.

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Session Classification: Parallel II: B9 Light Quarks

Track Classification: Section B: Light Quarks