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The strong coupling from an improved tau vector isovector spectral function

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We use a new, more precise, non-strange, inclusive vector isovector spectral function to determine the strong coupling at the tau mass scale employing finite energy sum rules. The new spectral function is obtained from a combination of (i) ALEPH and OPAL results for the 2 pion and 4 pion tau decay channels, (ii) recent BaBar results for the tau K Kbar decay distribution, and (iii) estimates of the contributions from other hadronic tau decay modes from recent electroproduction data, related using CVC, for subleading contributions. This new inclusive spectral function is fully data based and does not rely on Monte Carlo simulated data. Using the fixed-order perturbation theory (FOPT) prescription, we find for the strong coupling at the tau mass the value 0.3077(75), which corresponds to the five-flavor result 0.1171(10) at the Z mass. Additional experimental input on the dominant 2 pion and 4 pion tau decay modes would allow for further improvements to the current analysis.

What is your topic?

Hadronic decays

Primary authors: BOITO, Diogo (Universidade de São Paulo); MALTMAN, Kim (York University); GOLTERMAN, Maarten (San Francisco State University); RODRIGUES, Marcus (Universidade de São Paulo); SCHAAF, Wilder (San Francisco State University); PERIS, santiago (Univ. Autonoma de Barcelona)

Presenter: BOITO, Diogo (Universidade de São Paulo)

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