

Gemeinsame Veranstaltung von
Humboldt-Universität zu Berlin, Institut für Physik
(Theorie der Elementarteilchen / Computerorientierte Theoretische Physik)
DESY, Zeuthen

SONDER SEMINAR

Am Dienstag, dem **28 September**, um **16:00 Uhr s.t.** spricht

Prof. Dmitrii Vasil'evich Shirkov

Joint Institute for Nuclear Research – Dubna

zum Thema

Quasiperturbative QCD at low energy

Abstract

New non-power sets of quasi-perturbative expansion functions $\mathbf{w}_k(\alpha_s)$ are devised via condition of correspondence with ghost-free Analytic Perturbation Theory in QCD. Generally, they comprise singularity at the origin of complex α_s plane.

New functions are close to powers $(\alpha_s)^k$ of coupling constant for $\alpha_s \lesssim 0.3$, while around $\alpha_s \sim 0.4 - 0.7$ first two of them decline to limiting values ~ 0.5 and ~ 0.18 . In a sense, they mitigate an approach to “strong-coupling regime” by “effective saturation” at level $(\alpha_s^{eff})_{max} \sim 0.5$.

Being inserted by prescription $(\alpha_s)^k \rightarrow \mathbf{w}_k(\alpha_s)$ in Feynman PT expansion of some one-argument observable, like total cross-section or Adler function, they reproduce – by virtue of renormalization-group algorithm – non-power APT results. At the same time, they are eligible for effective improving perturbation expansion of some more involved objects (two-argument functions, e.c.t.) in low-energy region – typically below 2-3 GeV.

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