$R(s)$: theory basics

$$R(s) \approx \Im\, \Pi(s - i\delta)$$

$$3Q^2\Pi(q^2 = -Q^2) = \int e^{iqx} \langle 0|T[\ j^v_\mu(x) j^v_\mu(0)\ ]|0\rangle dx$$

MOST important (though trivial) technical observation:

In massless ($\equiv$ high energy) approximation

$R(s) \Rightarrow$ 1-scale problem

one needs only **pole** part (e.g. UV counterterm) of Π^B to get $R(s)$ and this is **MUCH** simple to compute (with the use of IRR (Infrared ReaRrangement)/Vladimirov, (78)/ and IR R^* -operation /K. Ch., Smirnov (1984)/)

$$\Pi^B(Q^2, \alpha_s^B) = \sum \frac{a_{ij}}{\epsilon^i} (\frac{\mu^2}{Q^2})^{\epsilon j} \ \ (D = 4 - 2\epsilon)$$

$$\frac{1}{\epsilon^n}(\frac{\mu^2}{Q^2})^{\epsilon n} \xrightarrow[\text{renormalization}]{\Uparrow} \mathrm{Ln}^n(\mu^2/Q^2) + \cdots \xrightarrow{\Im} \mathrm{Ln}^{n-1}(\mu^2/s) + \ldots$$

$$n = 0(\text{constant}) \xrightarrow{\Im} 0$$

The same is true for other correlators (scalar, tensor..) and also for massive corrections like

$\mathbf{m_q^2/s, m_q^4/s^2}$, etc. / J. Kühn, K.Ch (91,94)/