metric convention: $(+,-,-,-)$

1 Formalism

For the scattering amplitude $\mathcal{A}_{\alpha\beta}(s,t)$ where α and β represents particles' quantum numbers including helicity, the analyticity gives

$$\frac{\partial \mathcal{A}_{\alpha\beta}}{\partial s}(0,0) = \frac{1}{\pi}\int_{\infty}^{s_0} \frac{ds}{s^2}[\mathrm{Im}\mathcal{A}_{\alpha\beta}(s,0) - \mathrm{Im}\mathcal{A}_{\bar{\alpha}\beta}(s,0)] - C^{(s)}_{\infty,\alpha\beta}$$

and

$$\frac{\partial \mathcal{A}_{\alpha\beta}}{\partial t}(0,0) =,$$

neglecting the contribution of IR bound states.