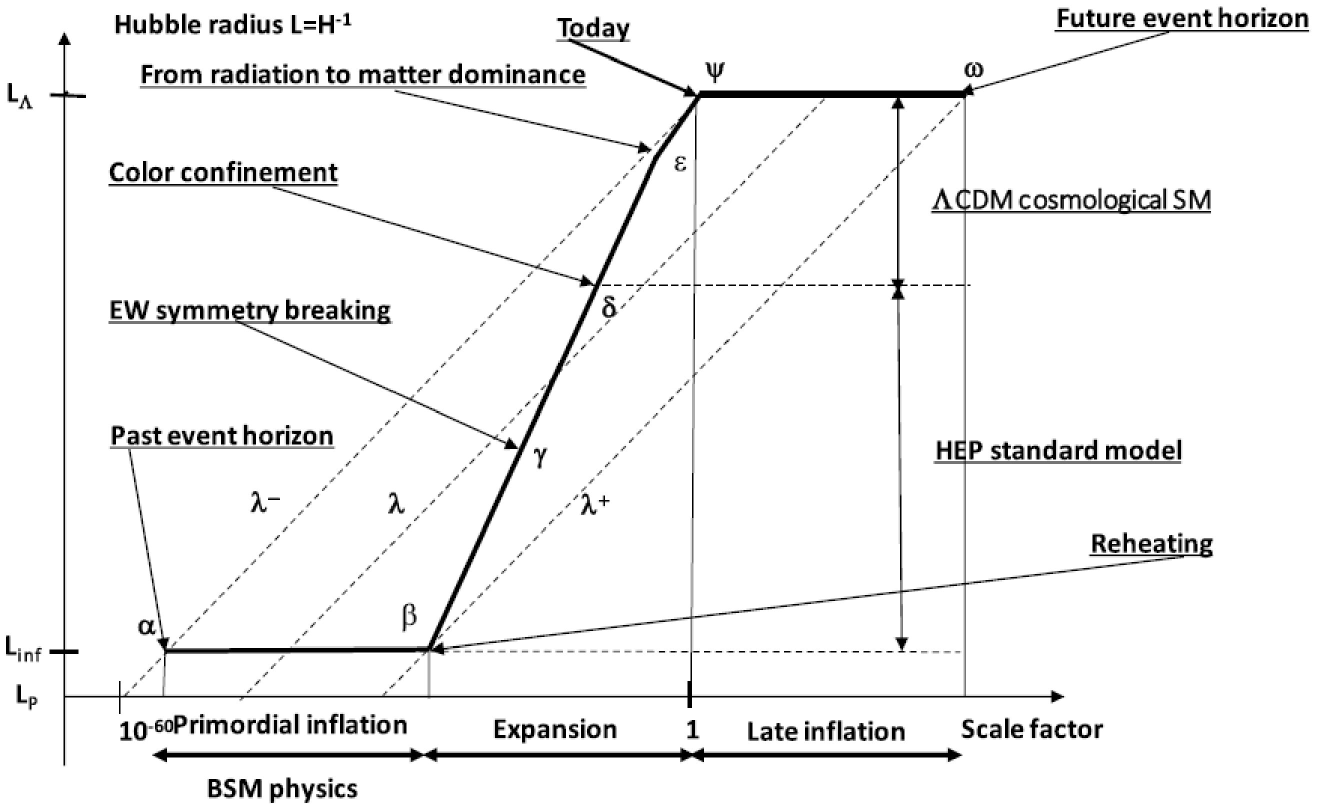
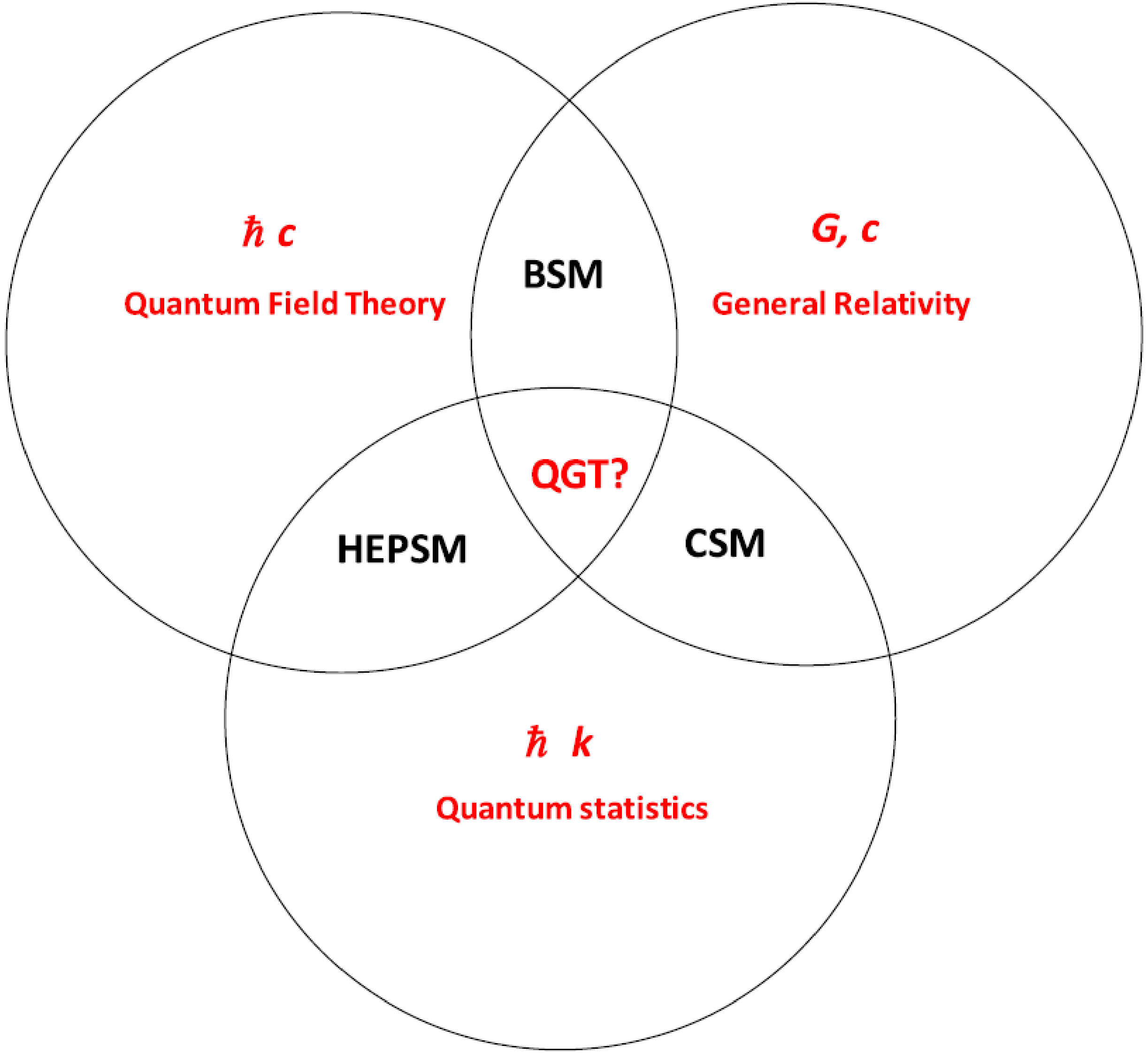
Regge poles in QCD

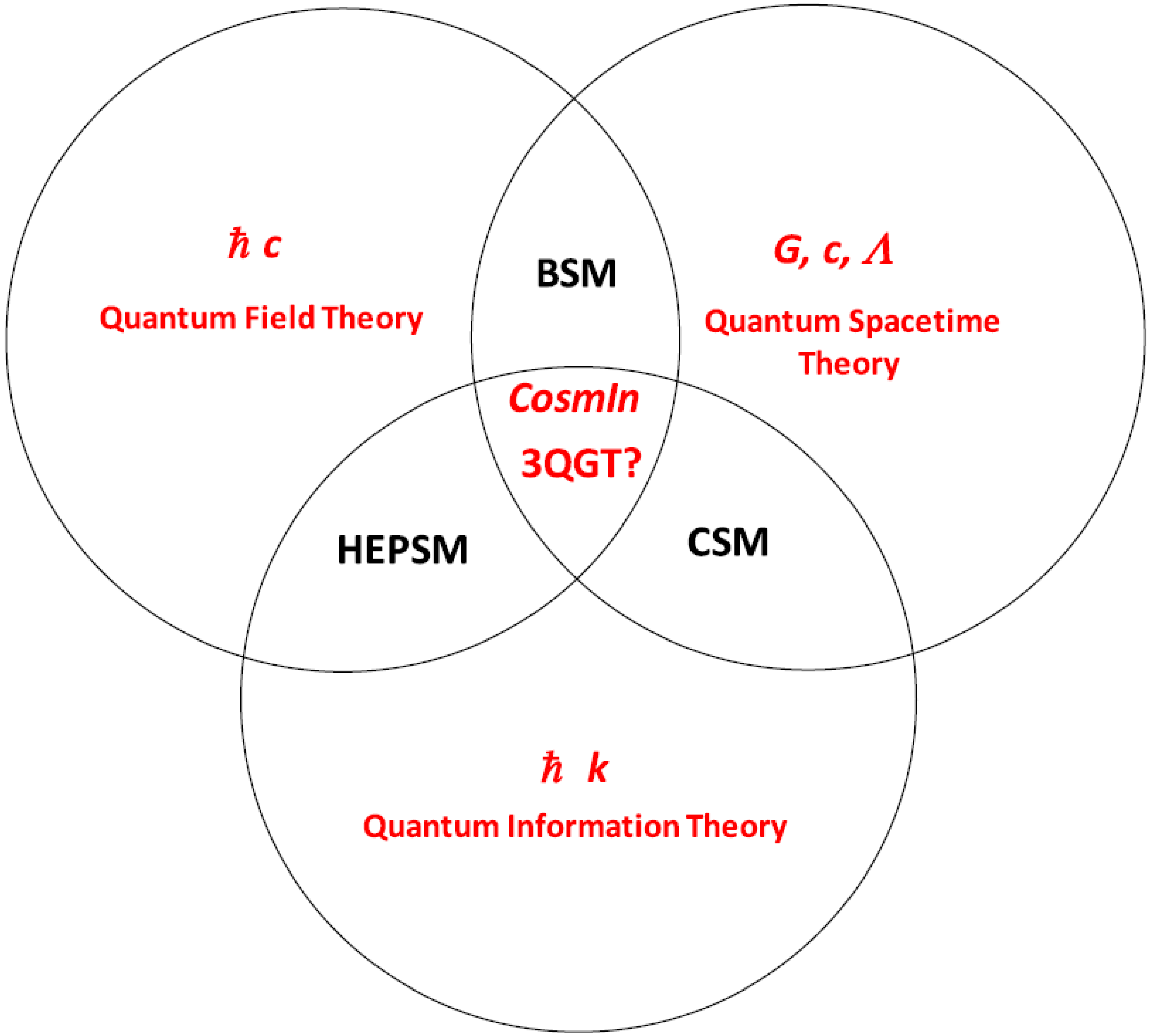
Gilles Cohen-Tannoudji



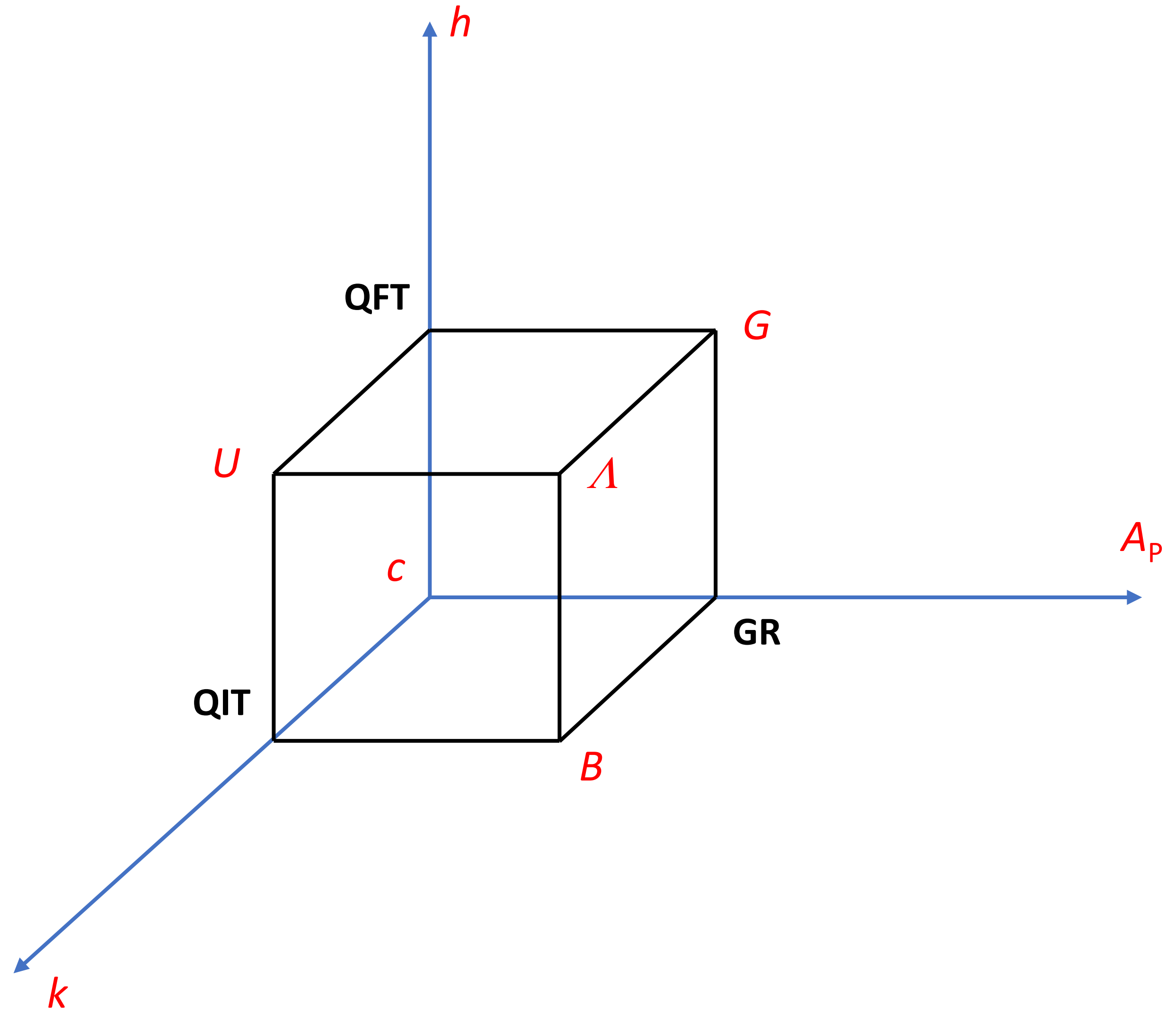
Hubble radius L=H-1
Today
Future event horizon
From radiation to matter dominance
ψ
ω
LΛ
ε
Color confinement
ΛCDM cosmological SM
δ
EW symmetry breaking
γ
Past event horizon
λ⁻
λ
λ⁺
HEP standard model
Reheating
β
α
Linf
Lp
10-60
Primordial inflation
Expansion
1
Late inflation
Scale factor
BSM physics



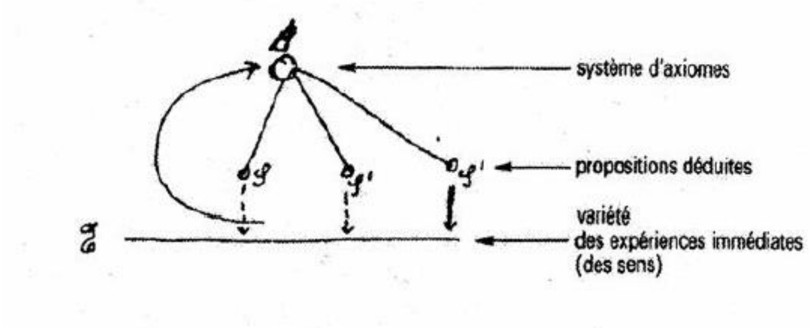
ħ c
Quantum Field Theory
BSM
G, c
General Relativity
QGT?
HEPSM
CSM
ħ k
Quantum statistics

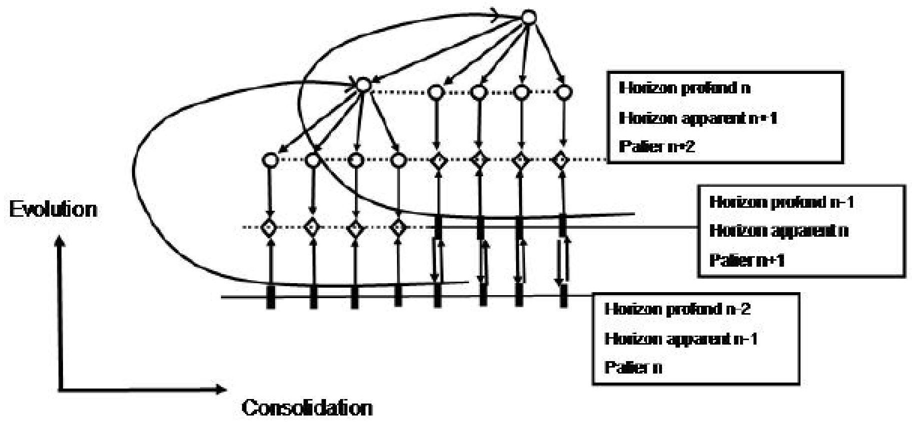


ħ c
Quantum Field Theory
BSM
G, c, Λ
Quantum Spacetime Theory
CosmIn
3QGT?
HEPSM
CSM
ħ k
Quantum Information Theory



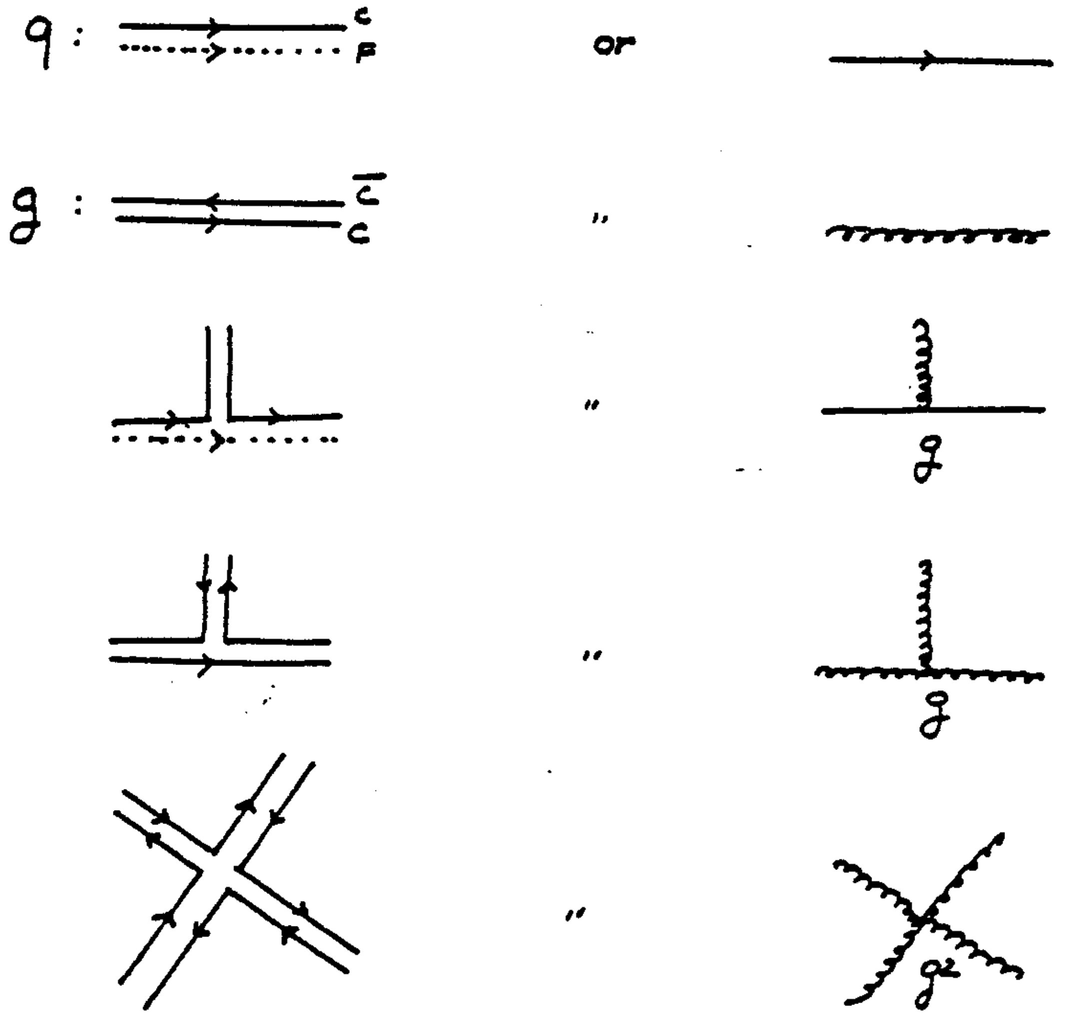
Caption
QFT: Quantum Field Theory
QIT: Quantum Information Theory
GR General Relativity
G: Newton's consatnt
B: Bekenstein's constant
U: Unruh's constant

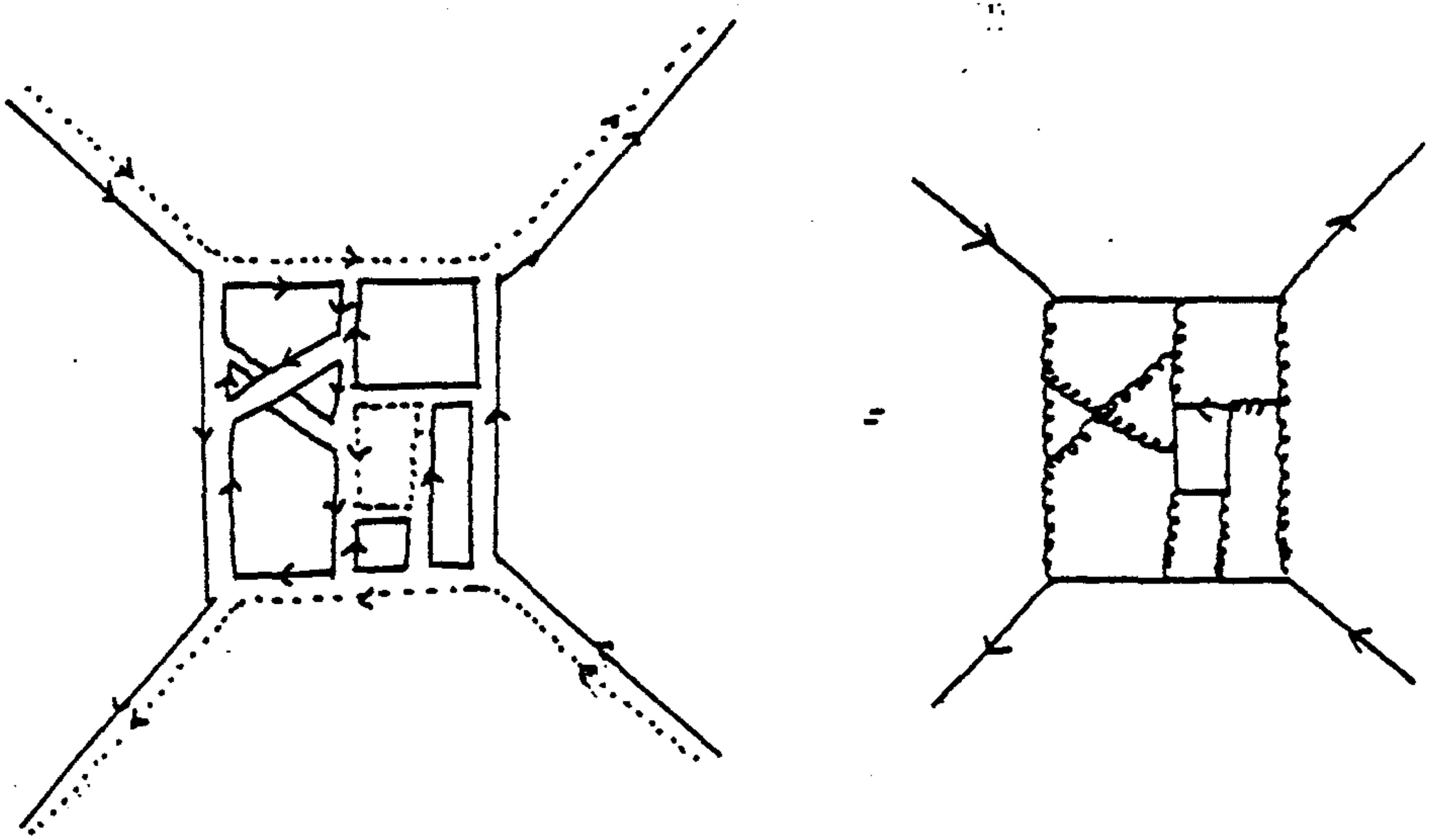




Essai de dialectisation du schéma d'Einstein

$$A_n(\{p_i\}) = g^n \sum_{b,h,l,w} (g^2)^{b-1} (g^2)^{2h} (g^2 N_c)^l (g^2 N_f)^w \tilde{A}^n_{b,h,l,w}(\{p_i\})$$





$n=4$; $b=1$; $h=1$; $l=4$; $\varpi=1$.

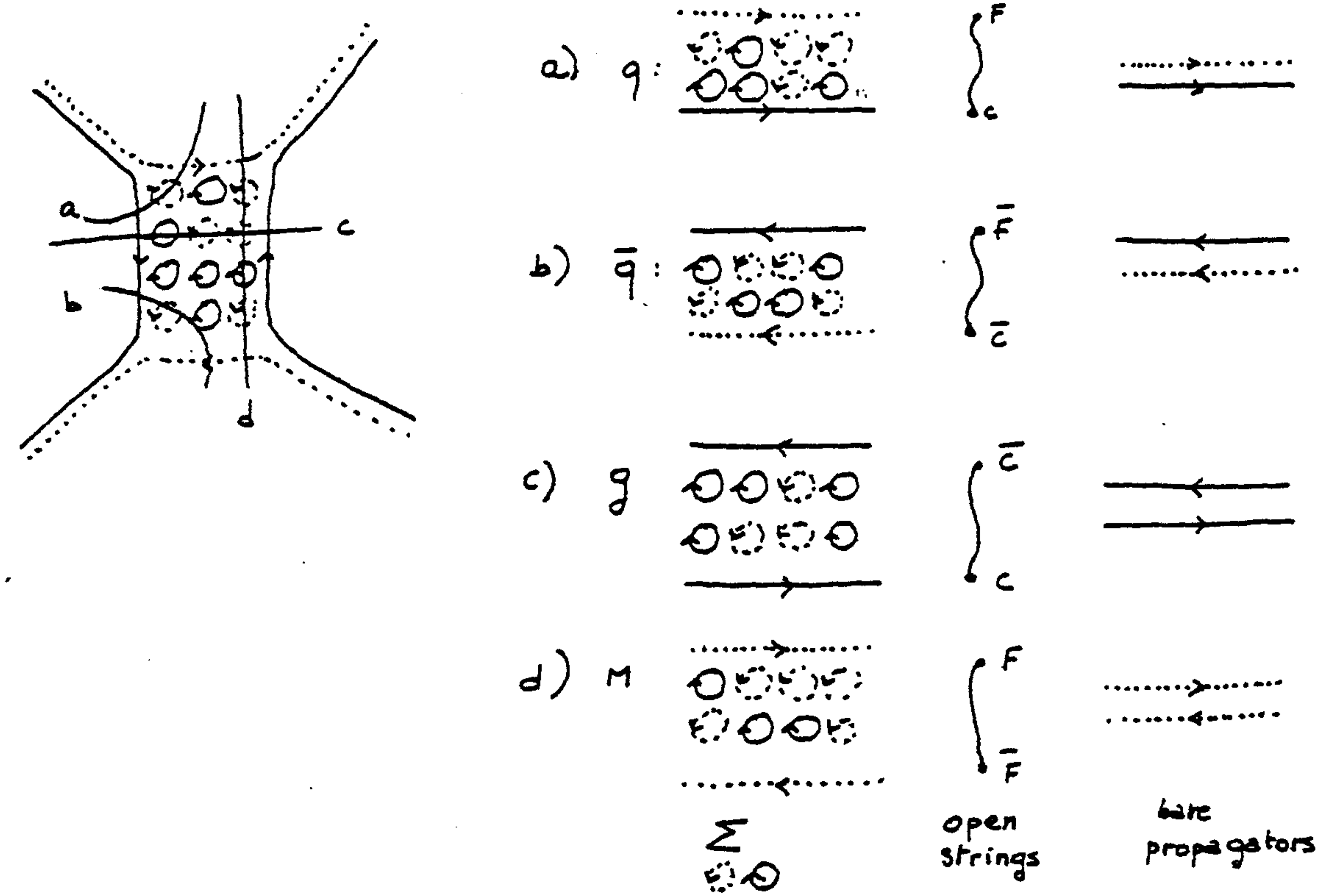
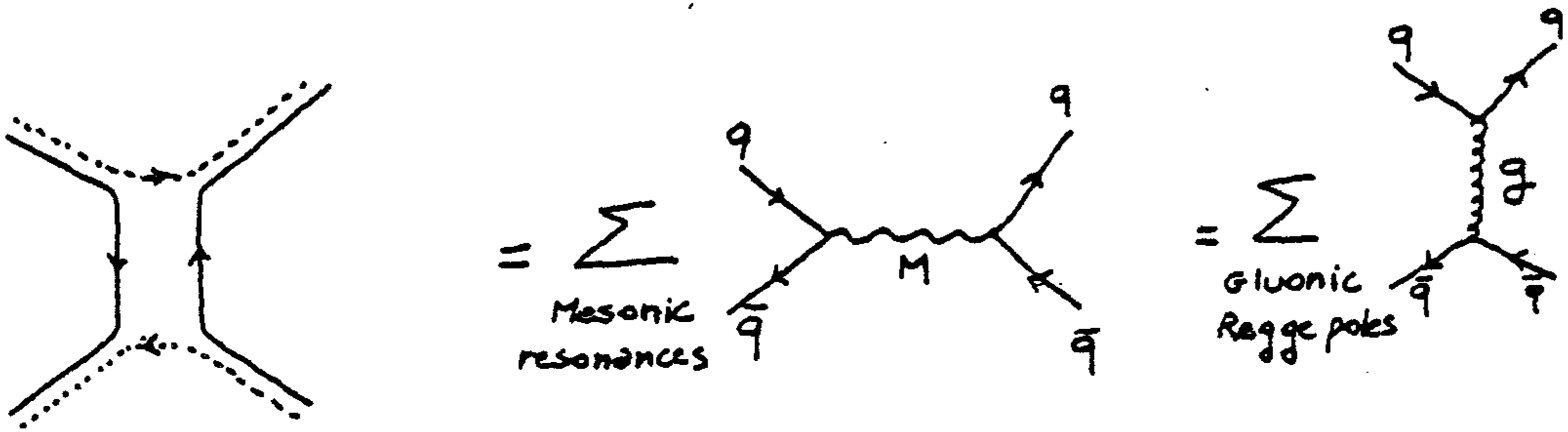


Fig. 4 : Four cuttings of the configuration of fig. 3b, exhibiting planar renormalized open string propagators. The corresponding bare propagators are those of the NRDM regularizing QCD.



<u>Fig. 5</u> : Duality properties of the $Q\bar{Q} \to Q\bar{Q}$ amplitude in the NRDM

$$V_t(s,t) = \{CF\} \frac{\Gamma(-\alpha_M(S) \quad \Gamma(-\alpha_g(t))}{\Gamma(-\alpha_M(s) \ -\alpha_g(t))}$$

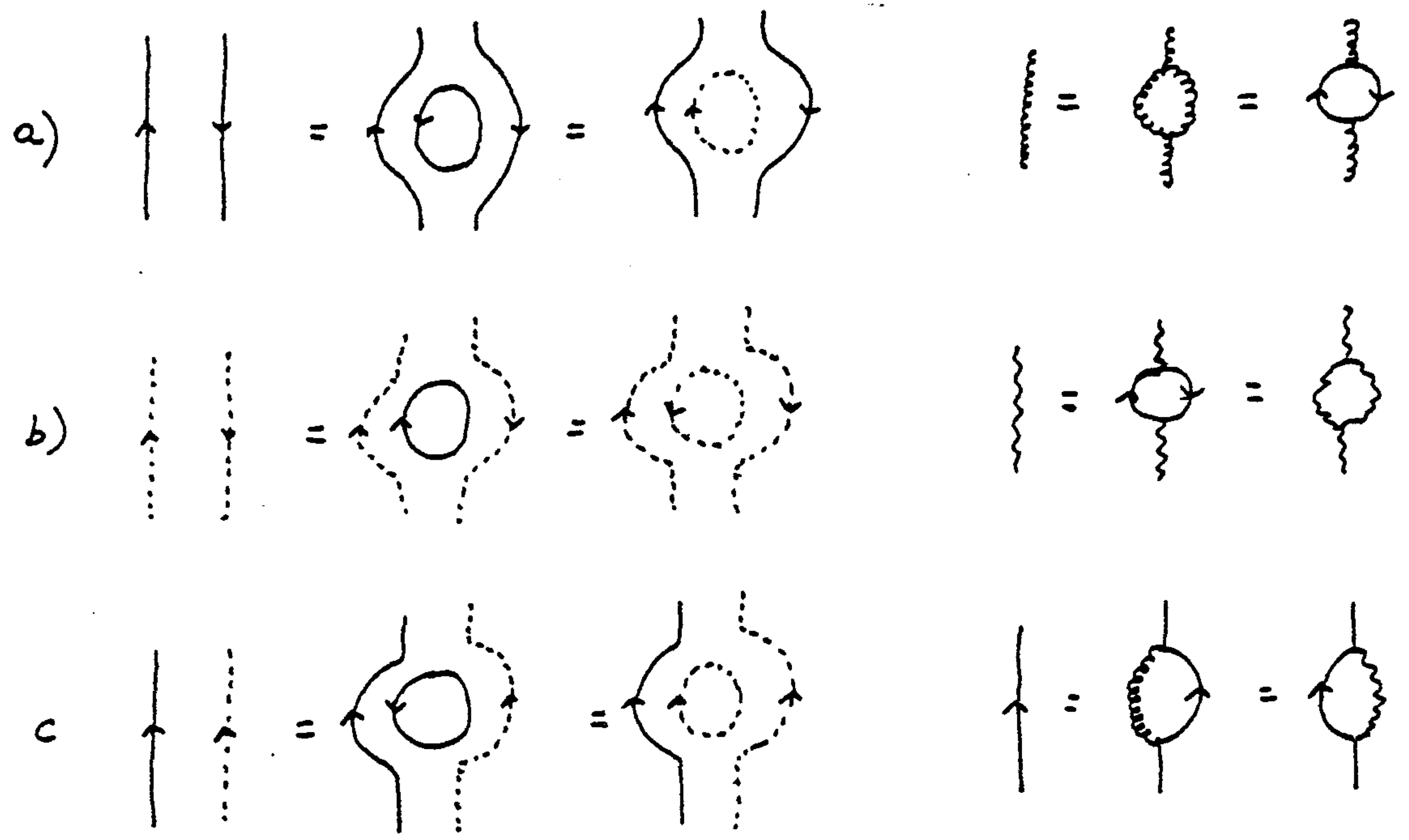


fig. 7 : planar bootstrap equations for the gluon (a) meson (b) and quark (c) propagators.

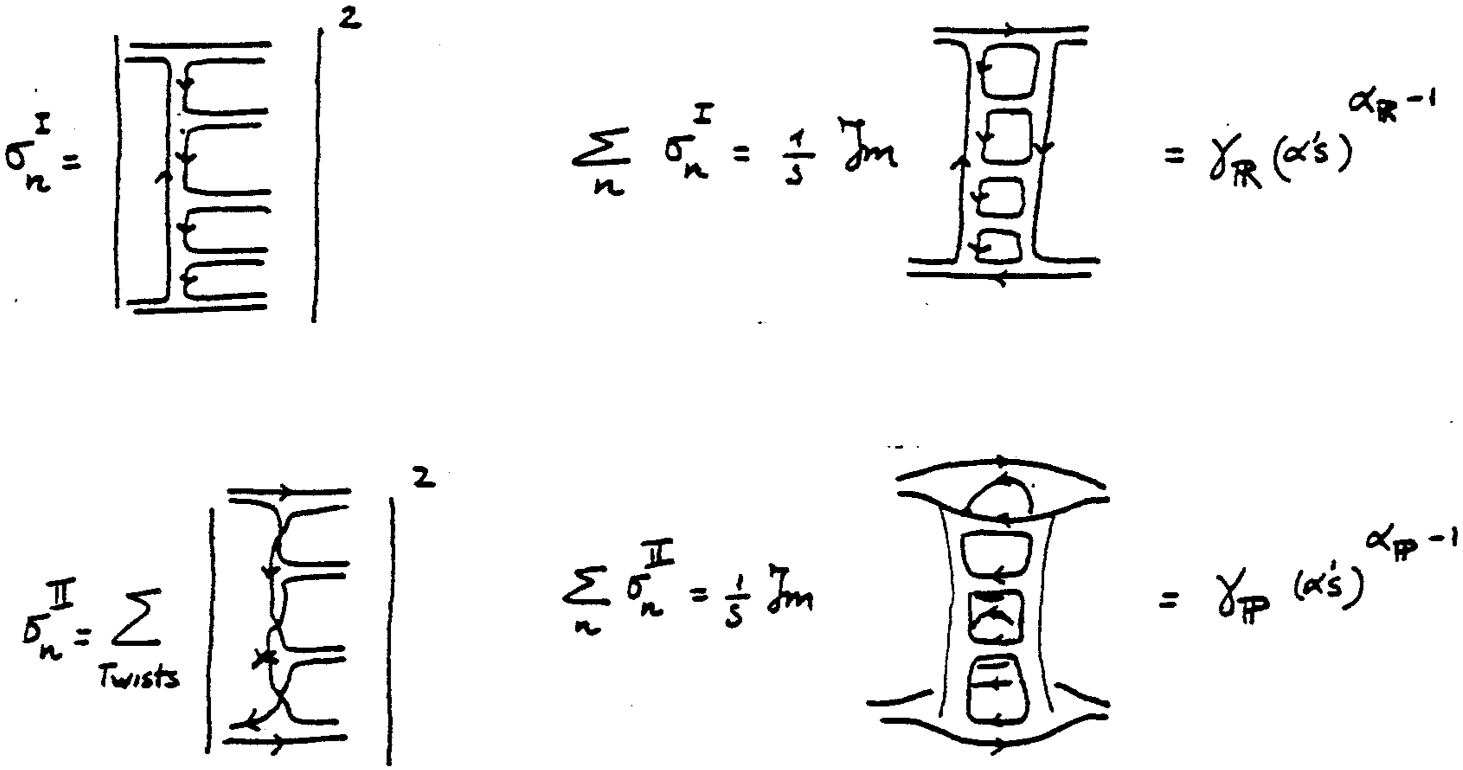


Fig. 8 - Building the planar reggeon (α_{IR}) and cylindrical pomeron (α_{IP}) from the shadow scattering on n particle multiproduction cross sections in the multi-reggeon approximation

$$\sigma_n^{I} = \frac{(g^2 N \log \alpha' s)^n}{n!} (\alpha' s)^{2\alpha_o - 2} \frac{1}{N} \qquad (11)$$

$$\alpha_n^{II} = \frac{(g^2 N \,\mathrm{Log}\, \alpha' s)^n}{n\,!} (\alpha' s)^{2\alpha_o - 2} \frac{2^{n-1} - N}{N^2} \qquad (12)$$

$$\alpha_{\mathbb{IR}} = 2\alpha_o - 1 + g^2 N \qquad (13\ a)$$

$$\alpha_{\mathbb{IP}} = 2\alpha_o - 1 + 2\, g^2 N \qquad (13\ b)$$

$$\frac{\gamma_{\mathbb{IP}}}{\gamma_{\mathbb{IR}}} = \frac{1}{2N} \qquad (13\ c)$$

$$\alpha_{\mathbb{IR}} = \alpha_o \Rightarrow \alpha_{\mathbb{P}} = 1$$