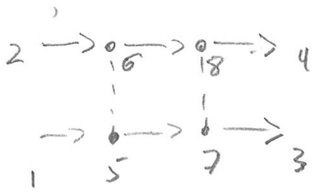
$$G_0^{-1} G_1 = 1 - i \int K(p_3 p_4, p_3 + p_4 - p_1, p)\, u(p - p_4) \frac{d^4p_3\, d^4p_4}{(2\pi)^8} =$$

$$= G_0^{-1} G_1 = 1 - i \int \Big[\delta(\cancel{p_3} + p_4 - p - \cancel{p_3})\, G_1(p_3 + p_4 - p)\, G_1(p) - \delta(p_3 + p_4 - p - p_4)\, G_1(p)\, G_1(p_3 + p_4 - p)\Big] u(p - p_4) \frac{d^4p_3\, d^4p_4}{(2\pi)^4}$$

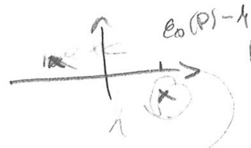
$$+ \int G_1(p_3)\, G_1(p_4)\, \Gamma(p_3, p_4, p_3 + p_4 - p_1, p)\, G_1(p_3 + p_4 - p)\, G_1(p) \underset{u(p-p_4)}{\wedge} \frac{d^4p_3\, d^4p_4}{(2\pi)^8} =$$

$$= 1 - i \int u(0)\, G_1(p_3)\, G_1(p) \frac{d^4p_3}{(2\pi)^4} + i \int u(p - p_4)\, G_1(p)\, G_1(p_4) \frac{d^4p_4}{(2\pi)^4}$$

$$+ \int G_1(p_3)\, G_1(p_4)\, \Gamma(p_3 p_4, p_3 + p_4 - p_1, p)\, G_1(p_3 + p_4 - p)\, u(p - p_4) \frac{d^4p_3\, d^4p_4}{(2\pi)^8}\, G_1(p)$$



$$\frac{1}{\omega_p - \varepsilon_0(p) + \mu + i0\, \mathrm{sgn}\, \omega_p} \times \frac{1}{\omega_{q-p} - \varepsilon_0(q - p) + \mu + i0\, \mathrm{sgn}(\omega_q - \omega_p)} =$$



non-zero

$\omega_p^* > 0 \qquad \omega_p^* = \varepsilon_0(p) - \mu \qquad \Rightarrow$

$\omega_p^* - \omega_q^* < 0 \qquad \omega_p^* - \omega_q^* = -\varepsilon_0(p - q) + \mu$

$\Rightarrow \begin{cases} \varepsilon_0(p) - \mu > 0 \\ \varepsilon_0(p - q) - \mu > 0 \end{cases}$ in contrast to the polarization operator

or $\begin{cases} \varepsilon_0(p) - \mu < 0 \\ \varepsilon_0(p - q) - \mu < 0 \end{cases}$

$$\int_0^1 \ln\left(\frac{\omega_D + \omega_q + v_F|q|x}{\omega_q + v_F|q|x}\right) dx \qquad \int_0^{\omega_D} \ln\left(\frac{\omega_q + 2\xi + v_F|q|}{\omega_q + 2\xi}\right) d\xi$$

$$\int \ln(x + x_0)\, dx = (x + x_0) \ln(x + x_0) - x$$