

$$= \int \frac{d^3 k}{(2\pi)^3} \int \frac{d^3 q}{(2\pi)^3} |t^{(j)}|^2 \frac{1}{2\omega_1} \frac{1}{2\omega_2} \frac{M}{E} \frac{1}{p^0 - \omega_1 - \omega_2 - E + i\epsilon}$$