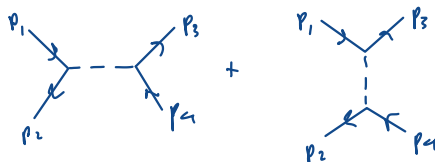


Clarification on overall minus signs

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- If you have to calculate the sum of these two diagrams:



→ take a look at the Wick contractions:

$$\langle p_3, p_4 | \bar{\psi}_1 \psi_1 \phi_1 \phi_2 \bar{\psi}_2 \psi_2 | p_1, p_2 \rangle =$$

$$\langle p_3, p_4 | \bar{\psi}_1 \psi_1 \phi_1 \phi_2 \bar{\psi}_2 \psi_2 | p_1, p_2 \rangle =$$

→ So in the t-channel you have to move two fermions through the lines which gives an overall minus.

- Now if you want to look instead at Compton scattering:

$$\langle p_3, p_4 | \bar{\psi}_1 \psi_1 \phi_1 \phi_2 \bar{\psi}_2 \psi_2 | p_1, p_2 \rangle =$$

$$\langle p_3, p_4 | \bar{\psi}_1 \psi_1 \phi_1 \phi_2 \bar{\psi}_2 \psi_2 | p_1, p_2 \rangle =$$

→ You see that you don't have to move fermions through each other, so you don't obtain an overall minus
(the scalar fields are just bosons, so you can move through those freely)