

$$\langle c | \hat{H}_I | c \rangle = \underbrace{\text{Diagram 1}}_{i,j} + \underbrace{\text{Diagram 2}}_{i,j} = \underbrace{\text{Diagram 3}}_{i,j} .$$

The equation shows the calculation of the expectation value $\langle c | \hat{H}_I | c \rangle$ using Feynman diagrams. The first term is the sum of two diagrams: a tadpole diagram with a loop on index i and a tadpole on index j , and a tadpole diagram with a loop on index j and a tadpole on index i . The second term is a diagram with two loops on index i and two loops on index j .