

$$\mathcal{M}_{\nu,k}^{s_i s_f}(\boldsymbol{q}) = \delta_{\boldsymbol{q},\boldsymbol{k}+\boldsymbol{G}} \frac{1}{\sqrt{N\Omega}} \sum_{\alpha=1}^3 \langle s_f | \hat{\mathcal{O}}_{\chi}^{\alpha}(\boldsymbol{q}) | s_i \rangle \epsilon_{\nu,k,G}^{\alpha}$$