$$G^{\theta}_{NN}(x_0) = a^3 \sum_{\underline{x}} \left\langle \mathcal{N}(\underline{x}, x_0)\mathcal{N}^{\dagger}(0) \right\rangle_{\theta} = G_{NN} + i\theta G^{Q}_{NN} + \mathrm{O}(\theta^2)$$