$$\mathcal{H}_N(t) = \sum_i C_i(t) \cdot \Phi_i(N) \quad \leftrightarrow \quad \mathcal{H}_{\mathrm{VCN}}(N, \vec{\eta}) = \sum_i \eta_i \cdot \Phi_i(N)$$

$$C_1(t) = \Pi_{\mathrm{A}}\,(0,1,t) \qquad \Phi_1(N) = J \sum_{l} \sum_{\substack{+(\mathrm{x}) \\ \langle l < m \rangle}} \sum_{K} \frac{\Psi_K}{\Psi_N} \langle N | \hat{\mathrm{F}}_{\mathrm{A}}\,(l,m) | K \rangle$$

$$C_2(t) = \Pi_{\mathrm{B}}\,(0,1,t) \qquad \Phi_2(N) = J \sum_{l} \sum_{\substack{+(\mathrm{x}) \\ \langle l < m \rangle}} \sum_{K} \frac{\Psi_K}{\Psi_N} \langle N | \hat{\mathrm{F}}_{\mathrm{B}}\,(l,m) | K \rangle$$

$$C_3(t) = \Pi_{\mathrm{C}}\,(0,1,t) \qquad \Phi_3(N) = J \sum_{l} \sum_{\substack{+(\mathrm{x}) \\ \langle l < m \rangle}} \sum_{K} \frac{\Psi_K}{\Psi_N} \langle N | \hat{\mathrm{F}}_{\mathrm{C}}\,(l,m) | K \rangle$$

$$C_4(t) = \Pi_{\mathrm{A}}\,(1,0,t) \qquad \Phi_4(N) = J \sum_{l} \sum_{\substack{+(\mathrm{x}) \\ \langle l > m \rangle}} \sum_{K} \frac{\Psi_K}{\Psi_N} \langle N | \hat{\mathrm{F}}_{\mathrm{A}}\,(l,m) | K \rangle$$

$$C_5(t) = \mathit{\Pi}_{\mathrm{B}}\,(1, 0, t) \qquad \mathit{\Phi}_5(N) = J \sum_{l} \sum_{\langle l \overset{+(\mathrm{x})}{>} m \rangle} \sum_{K} \frac{\Psi_K}{\Psi_N} \langle N | \hat{\mathrm{F}}_{\mathrm{B}}\,(l, m) | K \rangle$$

$$C_6(t) = \mathit{\Pi}_{\mathrm{C}}\,(1, 0, t) \qquad \mathit{\Phi}_6(N) = J \sum_{l} \sum_{\langle l \overset{+(\mathrm{x})}{>} m \rangle} \sum_{K} \frac{\Psi_K}{\Psi_N} \langle N | \hat{\mathrm{F}}_{\mathrm{C}}\,(l, m) | K \rangle$$

$$C_7(t) = \mathit{\Pi}_{\mathrm{A}}\,(0, M, t) \qquad \mathit{\Phi}_7(N) = J \sum_{l} \sum_{\langle l \overset{+(\mathrm{y})}{<} m \rangle} \sum_{K} \frac{\Psi_K}{\Psi_N} \langle N | \hat{\mathrm{F}}_{\mathrm{A}}\,(l, m) | K \rangle$$

$$\ldots \qquad \ldots$$