

$$H_{l\text{-doubling}} = 2\pi\hbar c \sum_t \sum_{\pm} \frac{B_e^2}{\omega_s} \left[q_{t\pm}^2 + 2 \left(q_{t\pm}^2 + \frac{p_{t\pm}^2}{\hbar^2} \right) \sum_s \frac{(\zeta_{ts}^x)^2 \omega_2^2}{\omega_t^2 - \omega_2^2} \right] J_{\pm}^2 + \frac{q_{tD}}{2} \{ H_{t:l\text{-doubling}}, (J - S)^2 \}$$