

$$U(T_t \tilde{q}, t) := \int_{\mathbb{R}} \mathrm{d}\xi \, \xi \int_0^1 \mathrm{d}\eta \, \lambda(\tilde{q}, t + (\eta - 1)\xi, t + \eta\xi) \, \delta \tilde{q}(t + \eta\xi)$$