

Quantum Field Theory Equation Sheet

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Here are some useful equations

Table 1: Equation Sheet

Name/Description	Equation	Remarks
Noether conserved current	$j^\mu = \partial_{\partial_\mu \phi} \mathcal{L} \delta \phi - F^\mu$	here $\mathcal{L}(x + \delta x) = \mathcal{L} + \delta x \partial_\mu F^\mu$, $\partial_\mu j^\mu = 0$
The conserved charge arising from a conserved current	$Q = \int d^3x j^0$	
The Energy-Momentum Tensor	$T^\mu_\nu = \partial_{\partial_\mu \phi} \mathcal{L} \partial_\nu \phi - \delta^\mu_\nu \mathcal{L}$	This is the Noether current under translation. This tensor can always be chosen to be symmetric. It is a Noether current, so conserved as $\partial_\mu T^{\mu\nu} = 0$