

$$\phi(x) = \int_{\Sigma} \frac{d^d \Sigma^{\mu}}{(2\pi)^d} \frac{d^d P}{2E_P} \left[\int \frac{d^d p}{2E_p} \langle\langle x | \boldsymbol{p} \rangle\rangle \left(-2i \frac{\partial}{\partial X^{\mu}} \langle\langle \boldsymbol{p} | X, \boldsymbol{P} \rangle\rangle \right) A_{X,P} + \text{h.c.} \right]$$