

$$S = \int d^4x \sum_{n=0}^{\infty} 2\pi R \left[\partial^M \Phi^{(n)\dagger} \partial_M \Phi^{(n)} - \left(m^2 + \frac{n^2}{R^2} \right) \Phi^{(n)\dagger} \Phi^{(n)} + \cdots \right]$$