



Holographic superconductors

1 BF bound and spontaneous scalarization

When studying the holographic superconductor, we have set

$$m_\psi^2 = -\frac{2}{\ell^2} \tag{1}$$

for the mass of the scalar field. Going beyond the test field limit, let us consider planar *extremal* charged AdS_4 black hole as our gravity background. Recall the BF bound in AdS_d discussed in the lecture. Can you figure out as to why the above black hole is subject to spontaneous scalar field condensation? Why is the above choice for the mass a good one?