

SYK model

Charged black holes

A

$$\frac{S(T)}{k_B} = N(\mathcal{S} + \gamma k_B T) - \frac{3}{2} \ln\left(\frac{U}{k_B T}\right) + \dots$$

$$\frac{S(T)}{k_B} = \frac{1}{\hbar G} \left(\frac{A_0 c^3}{4} + \frac{\sqrt{\pi} A_0^{3/2} c^2 k_B T}{2 \hbar} \right) - \frac{3}{2} \ln\left(\frac{U}{k_B T}\right) + \dots$$

B

$$G(\tau) \sim e^{-2\pi\mathcal{E}T\tau} \left(\frac{T}{\sin(\pi T\tau)} \right)^{2\Delta}$$

$$G(\tau) \sim e^{-2\pi\mathcal{E}T\tau} \left(\frac{T}{\sin(\pi T\tau)} \right)^{2\Delta}$$

C

$$\frac{1}{k_B} \frac{d\mathcal{S}}{dQ} = 2\pi\mathcal{E}$$

$$\frac{1}{k_B} \frac{d\mathcal{S}}{dQ} = 2\pi\mathcal{E}$$

D

$$\mathcal{N}_Q(E) \sim \exp(N\mathcal{S}) \sinh\left(\sqrt{2N\gamma E}\right)$$

$$\mathcal{N}_Q(E) \sim \exp\left(\frac{A_0 c^3}{4\hbar G}\right) \sinh\left(\left[\sqrt{\pi} A_0^{3/2} \frac{c^3}{\hbar G} \frac{E}{\hbar c}\right]^{1/2}\right)$$