

- The  $\text{AdS}_4$  solutions satisfy two sum rules which are expected to be satisfied by all CFT3s:

$$\int_0^\infty d\omega \left( \text{Re} [\Sigma(\omega)] - \Sigma(\infty) \right) = 0$$
$$\int_0^\infty d\omega \left( \text{Re} \left[ \frac{1}{\Sigma(\omega)} \right] - \frac{1}{\Sigma(\infty)} \right) = 0$$

The second sum rule relies on the existence of a S-dual CFT3.

- The poles *and zeros* of the complex function  $\Sigma(\omega)$  are expected to be in the lower-half plane.
- The Boltzmann theory does *not* obey the above exact properties.