

Chapter 2

AdS-CFT

The discovery of the AdS/CFT correspondence was built upon a whole raft of previous discoveries and conjectures. Here we ignore the historical steps that led to its discovery, and simply introduce it, as if by magic, as it stands today. On one side we have a type IIB string theory in the geometry induced by an infinite stack of D3 branes. The other side is a conformal gauge theory with an infinite number of colours. First we address the D3-brane construction.

2.1 String description

Our starting point is to put N D3-branes in the centre of a ten dimensional space, which is otherwise empty. There will be three types of interaction: those amongst the open strings on the branes; those amongst the closed strings in the bulk; and those between the open and closed strings. We can write the effective action as

$$S = S_{\text{bulk}} + S_{\text{brane}} + S_{\text{int}} \tag{2.1}$$