

D-branes within coset approach

Sergey Krivonos

JINR
Joliot Curie 6, Dubna
Russia
krivonos@theor.jinr.ru

We derive the component on-shell action of the space-filling D3-brane, i.e. $N = 1$ supersymmetric Born–Infeld action, within the nonlinear realization approach. The covariant Bianchi identity defining the $N = 1$, $d = 4$ vector supermultiplet has been constructed by introducing a new bosonic Goldstone superfield associated with the generator of the $U(1)$ group, which transforms to each other the spinor generators of unbroken and spontaneously broken $N = 1$, $d = 4$ supersymmetries. The first component of this Goldstone superfield is the auxiliary field of the vector supermultiplet and, therefore, the Bianchi identity can be properly defined. The component action of the D3-brane has a very simple form, being written in terms of derivatives covariant with respect to spontaneously broken supersymmetry — it just mimics its bosonic counterpart.