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HOLOMORPHIC GAUGE FIELDS ON *B*-BRANES*

ANDRÉS VIÑA

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Considering the *B*-branes over a complex manifold as the objects of the bounded derived category of coherent sheaves on that manifold, we extend the definition of holomorphic gauge fields on vector bundles to *B*-branes. We construct a family of coherent sheaves on the complex projective space, which generates the corresponding bounded derived category and such that the supports of the elements of this family are two by two disjoint. Using that family, we prove that the cardinal of the set of holomorphic gauge fields on any *B*-brane over the projective space is less than two.

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1. Introduction

Given a holomorphic vector bundle W over a complex manifold Y, a connection on W is holomorphic if the covariant derivative of any holomorphic section of W is also holomorphic. Thus, the holomorphic connections are compatible with the holomorphic structures.

Sixty-seven years ago, Atiyah initiated the study of these connections in this context; in the category of holomorphic vector bundles [3]. Our purpose is to extend this concept to objects of more general categories.

But to which categories? The framework of vector bundles has some homological shortcomings. The category $\mathbf{Vec}(Y)$ of holomorphic vector bundles over the complex manifold Y is not abelian: not every morphism has cokernel. In fact, the cokernel of a morphism of vector bundles is a sheaf.

A natural generalization would be to move to the category of sheaves. However, there are sheaves so "bad" that they are even be supported on Cantor sets. It is therefore advisable to restrict oneself to sheaves with"non-wild singularities". The coherent sheaves are closely related with the geometry of the underlying space.

*In memoriam to Ange Viña.