



SPANNING CLASS IN THE CATEGORY OF BRANES

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Abstract. Given a generic anticanonical hypersurface Y of a toric variety determined by a reflexive polytope, we define a line bundle \mathcal{L} on Y that generates a spanning class in the bounded derivative category $D^b(Y)$. From this fact, we deduce properties of some spaces of strings related with the brane \mathcal{L} . We prove a vanishing theorem for the vertex operators associated to strings stretching from branes of the form $\mathcal{L}^{\otimes i}$ to nonzero objects in $D^b(Y)$. We also define a gauge field on \mathcal{L} which minimizes the corresponding Yang-Mills functional.

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1. Introduction

It is well-known that a compact toric manifold is not Calabi-Yau. However, Batyrev [3] showed the existence of anticanonical hypersurfaces, in the toric variety X determined by a reflexive polytope, that are Calabi-Yau. In this note, we will prove some particular properties of D -branes, strings, vertex operators and gauge fields on these hypersurfaces.