Picard-Fuchs Ideals for Calabi-Yau Manifolds with many Moduli

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Abstract

The efficient computation of period integrals for families of Calabi-Yau manifolds plays a central role for many applications in string compactifications. A very useful tool for this aim is given by the corresponding Picard-Fuchs differential ideals.

Existing methods to compute Picard-Fuchs ideals are usually limited to Calabi-Yau families with a moderat number of complex structure moduli. Based on a "guessing method", we systematically compute Picard-Fuchs ideals for Calabi-Yau threefolds which are hypersurfaces of toric varieties. Examining this large class of examples, we conjecture general properties of Picard-Fuchs ideals which might lead to a deeper understanding of the moduli space geometry of Calabi-Yau threefolds.

Keywords: string compactifications, Calabi Yau manifolds

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