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Rigid Calabi-Yau Banana Manifolds

We construct new rigid Calabi-Yau threefolds with small Hodge numbers : $h^{1,1} = 4, h^{1,2} = 0$. These threefolds are fibered by Abelian surfaces and have singular fibers containing Banana configurations of rational curves. We have proven that the genus g Gromov-Witten potential $F_g(Q_0, Q_1, Q_2, Q_3)$, when specialized to $Q_0 = 0$, is given by an explicit genus 2 Siegel modular form of weight $2g - 2$.