Backreaction of Fluxes on Calabi-Yau Metrics

Monday, 2 June 2025 11:00 (1 hour)

We want to study warped IIB flux solutions using the setup of Giddings-Kachru-Polchinski. The solution leads to a warped metric with a warp factor that only depends on the internal coordinates. We want to study the functional form of the warp factor to investigate the singular bulk problem, which states that the warped region is not a small throat in the CY but almost the entire CY becomes strongly warped, which means that the supergravity solution is not well under control. I will explain the necessary steps to study this, which include approximating the CY metric with a neural network, finding imaginary self-dual flux solutions that stabilize the complex structure moduli close to a conifold point, constructing a basis of harmonic (2,1) forms (again using neural networks), and solving the differential equation for the warp factor (using a third neural network). We also discuss several improvements we made to minimize the numerical errors close to the singular regions.

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