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Scale-separated Type IIA AdS₃ vacua and O6-plane backreaction

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We discuss flux compactifications of massive Type IIA string theory on G₂ spaces with O₂/O₆-planes to three dimensions. We start by presenting the setup of allowed fluxes, internal geometry and equations of motion and after compactification we achieve N=1 and N=0 AdS₃ vacua with scale that can be parametrically decoupled from the KK modes. We use the smeared approximation description for our sources. The solutions we find are at weak coupling and large volume regime while the moduli are fully stabilized at the classical level. Next, utilizing the equations of motion including varying warp factor and dilaton we evaluate the backreaction of O₆-planes. Using the appropriate flux scaling we show that the corrections to the various background fields and moduli are controlled and subleading when going from smeared to localized sources. Similarly, the backreaction corrections to the scalar potential are parametrically small in the scale-separation limit, assuming always that the near-O₆-plane singularities will find a resolution within string theory, even in the presence of a Romans mass.

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