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Supersymmetry breaking, heterotic strings and fluxes CHRIS BERTINATO, KATRIN BECKER, YU-CHIEH CHUNG, GUANGYU GUO, Texas A&M University — Toward constructing supersymmetry breaking torsional backgrounds in heterotic string theory we consider a type IIB background which arises as the orientifold limit of a flux background of M-theory on $K3 \times K3$. In type IIB the background geometry is a product of 4d Minkowski space with $K3 \times T^2/\mathcal{Z}_2$. We then derive the conditions imposed upon the fluxes by supersymmetry. Inspired by a duality known to exist between type IIB and the heterotic theory in the context of preserved supersymmetry, we construct torsional flux backgrounds in the heterotic theory. We explicitly show that the new heterotic backgrounds solve the equations of motion. Then we proceed to analyze the conditions for unbroken supersymmetry and show how to construct susy breaking backgrounds with a vanishing cosmological constant in four dimensions. These solutions are a step towards addressing the question on how to stabilize moduli in compactifications of heterotic string theory.

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