Donaldson-Thomas invariants of local elliptic surfaces

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We compute the DT invariants of local elliptic surfaces by introducing a new computational technique, which is a mixture of motivic and toric methods. This allows us to write the generating function in terms of the topological vertex even though the geometry is not globally toric. Using identities for the topological vertex, this leads to a product formula in terms of the Dedekind eta and Jacobi theta function. For K3, this gives a new derivation of the Katz-Klemm-Vafa formula.
Joint work with Jim Bryan.