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Derived equivalence for the simple flop of type $G_2^\dagger$

Wednesday 5 February 2025 11:30 (1 hour)

In this talk we discuss an example of a simple flop that was found by Kanemitsu, from the point of view of derived categories. A simple flop is a flop between two smooth varieties that is connected by one smooth blow-up and one smooth blow-down, and those flops were partially classified by Kanemitsu, using Dynkin data. The exceptional divisor of the blow-ups has two projective bundle structures of the same rank, and is called a roof. The simple flop of type $G_2^\dagger$, which we discuss in this talk, is the only known example of a simple flop that has the non-homogeneous roof. The main theorem of the talk is that the simple flop of type $G_2^\dagger$ gives a derived equivalence. The proof is done by using tilting bundles, and hence it also produces a noncommutative crepant resolution that is derived equivalent to both sides of the flop. Despite its Dynkin label, the construction of the tilting bundles is related to rational homogeneous manifolds of Dynkin type B_3 and D_4.

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