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Exceptional collections of line bundles on projective homogeneous varieties.

It has been conjectured that, for every projective homogeneous variety X over the complex numbers, the bounded derived category $D^b(X)$ of coherent sheaves on X contains a full exceptional collection of vector bundles. (This is desirable in the sense that the existence of such a collection gives a way to break up $D^b(X)$ into simple components.) We focus on projective homogeneous varieties under groups of rank at most 2 and settle the question of existence of a full exceptional collection consisting of line bundles. The most difficult case is the variety of Borel subgroups for a group of type G_2 . (Received September 01, 2012)