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*Azumaya maximal orders do not always exist.*

I will explain how to use the homotopy theory of classifying spaces of algebraic groups to construct smooth complex varieties  $X$  and Brauer classes  $\alpha$  over  $X$  with the following property: if  $D$  is the division algebra over the function field of  $X$  with Brauer class  $\alpha$ , then there is no Azumaya algebra on  $X$  with class  $\alpha$  that restricts to  $D$ . In particular, no maximal order over  $X$  in  $D$  is Azumaya; equivalently, no maximal order over  $X$  in  $D$  is locally free. (Received September 17, 2012)