1021-14-176 **David E Speyer*** (`speyer@umich.edu`), Department of Mathematics, 2074 East Hall, 530 Church Street, Ann Arbor, MI 48105. *Matroid Invariants and K-Theory.*

Let x be a point of the Grassmannian $G(d,n)$. The matroid of x consists of the data of which of the Plücker coordinates of x are zero. Experience has shown that this data captures the "combinatorial features" of x and matroid theorists have found many productive numerical and polynomial invariants to associate to x.

Let T be the torus $(\mathbb{C}^*)^n$ acting on $G(d,n)$ and let $\overline{Tx}$ be the closure of the T orbit through x. The class of the structure sheaf of $\overline{Tx}$ in $K_0(G(d,n))$ depends only on the matroid of x. As I will explain, a number of well known matroid invariants are, either provably or conjecturally, the result of applying linear functions on $K_0(G(d,n))$ to the structure sheaf of $\overline{Tx}$. I will describe how, by considering K-theory I found a new matroid invariant, which behaves nicely under the operations of matroid duality, direct sum, two-sum and series-parallel extension. Using this invariant, I was able to show that if x_{gen} is a generic point of $G(d,n)$ and T_0 is the limit of a T-equivariant degeneration of $\overline{Tx_{\text{gen}}}$ then T_0 contains at most $(n-c-1)!/(d-c)!(n-d-c)!(c-1)!$ strata of dimension $n-c$.

I will not assume prior knowledge of K-theory. (Received September 04, 2006)