1114-14-299          **Alfonso Zamora\*** (`alfonso.zamorasaiz@csuci.edu`), One University Drive, Camarillo, CA
93012. *GIT characterizations of Harder-Narasimhan filtrations.*

We will present constructions of moduli spaces in algebraic geometry by using Geometric Invariant Theory (GIT). When performing such constructions we usually impose a notion of stability for the objects we want to classify and another notion of GIT stability appears, then it is shown that both notions coincide. For an object which is unstable there exists a unique canonical filtration, called the Harder-Narasimhan filtration. On the other hand, GIT stability is checked by 1-parameter subgroups by the classical Hilbert-Mumford criterion, and it turns out that there exists a unique 1-parameter subgroup giving a notion of maximal unstability in the GIT sense. We show that this special 1-parameter subgroup can be converted into a filtration of the object and coincides with the Harder-Narasimhan filtration, hence both notions of maximal unstability are the same. This correspondence can be implemented for the moduli problem of classifying coherent sheaves on a smooth complex projective variety, as well as other moduli problems: holomorphic pairs, Higgs sheaves, rank 2 tensors or quiver representations. (Received August 31, 2015)