

1089-22-125

**Mark Reeder\*** ([reederma@bc.edu](mailto:reederma@bc.edu)). *On the Geometric Invariant Theory of Moy-Prasad filtrations.*

A reductive  $p$ -adic group  $G$  is like an ocean. At each point  $x$  on the surface of the ocean, the depths of  $G$  are layered by Moy-Prasad filtrations of the parahoric subgroup at  $x$ . The graded version of the filtration at  $x$  turns out to be identical to the grading on the Lie algebra of  $G$  (reduced modulo  $p$ ) whose Kac coordinates are given by  $x$ . The GIT of such gradings was described by Vinberg over  $\mathbb{C}$ , and extended to base fields of characteristic  $p > 0$  by Levy. When applied to  $p$ -adic groups, this connection between Moy-Prasad and Vinberg-Levy theories gives new constructions of supercuspidal representations of  $G$  arising from stable vectors in the epipelagic zone at  $x$ , and solves the fundamental problem of classifying nondegenerate  $K$ -types in Moy-Prasad theory. This is joint work with Jiu-Kang Yu. (Received February 08, 2013)