1077-20-1137 **Stavros Argyrios Papadakis** and **Bart Van Steirteghem*** (`bartvs@mec.cuny.edu`), Department of Mathematics, Medgar Evers College (CUNY), 1650 Bedford Ave, Brooklyn, NY 11225. *The invariant Hilbert scheme of a spherical module.* Preliminary report.

Let G be a complex connected reductive linear algebraic group and let V be a finite-dimensional G-module. The invariant Hilbert scheme $\mathrm{Hilb}_h^G(V)$, introduced by V. Alexeev and M. Brion, parametrizes the G-stable ideals I of the polynomial ring $\mathbb{C}[V]$ for which the G-module $\mathbb{C}[V]/I$ has prescribed multiplicities given by a function $h : \mathrm{Irr}(G) \to \mathbb{Z}_{\geq 0}$.

Suppose W is a *spherical* G-module (i.e. $\mathbb{C}[W]$ is a multiplicity-free G-module) and denote $h_W : \mathrm{Irr}(G) \to \{0,1\}$ its *invariant Hilbert function*, so that $\mathbb{C}[W] \cong \oplus_{M\in\mathrm{Irr}(G)} M^{h_W(M)}$ as a G-module. Let $T \subset G$ be a maximal torus and let $U \subset G$ be a maximal unipotent subgroup normalized by T. There is a (unique) finite-dimensional G-module V such that $\mathbb{C}[W]^U \cong \mathbb{C}[V^U]$ as T-modules. We will discuss our work on the invariant Hilbert scheme $\mathrm{Hilb}^G_{h_W}(V)$, which provides information on the equivariant degenerations of W. (Received September 16, 2011)