Equivariant degenerations of spherical modules for groups of type A

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Abstract: Let G be connected reductive algebraic group over $\mathbb{C}$, fix a Borel subgroup B of G and a maximal torus T in B, and let U be the unipotent radical of B. Call the monoid of dominant weights Λ^+ and let $\mathcal{S}$ be a submonoid of Λ^+ generated by linearly independent weights.

V. Alexeev and M. Brion introduced a moduli scheme $M_{\mathcal{S}}$ which classifies affine (multiplicity-free) G-varieties X equipped with a T-equivariant isomorphism $X//U \to \operatorname{Spec} \mathbb{C}[\mathcal{S}]$. It is an open subscheme of an invariant Hilbert scheme.

After recalling examples of $M_{\mathcal{S}}$ due to S. Jansou, P. Bravi and S. Cupit-Foutou, I will discuss joint work with S. Papadakis on the case where $\mathcal{S}$ is the weight monoid of a spherical G-module with G of type A. Unlike the aforementioned examples, this includes cases where $\mathcal{S}$ does not satisfy the following saturation condition of D. Panyushev: $\mathbb{Z}\mathcal{S} \cap \Lambda^+ = \mathcal{S}$ (here $\mathbb{Z}\mathcal{S}$ stands for the subgroup generated by $\mathcal{S}$ in the character group of T).