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*Bilinear and Quadratic Forms of Rational Modules of Split Reductive Groups*

The representation theory of semisimple algebraic groups over the complex numbers (equivalently, semisimple complex Lie algebras or Lie groups, or real compact Lie groups) and the question of whether a given complex representation is symplectic or orthogonal has been solved since at least the 1950s. Similar results for Weyl modules of split reductive groups over fields of characteristic different from 2 hold by using similar proofs. I will present analogues of these results for simple, induced and tilting modules of split reductive groups over fields of prime characteristic as well as a complete answer for Weyl modules over fields of characteristic 2. Our study involves using the cohomology for algebraic groups.

This represents joint work with Skip Garibaldi.