

Polar symplectic representations

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Following Dadok and Kac, a rational representation of a complex reductive linear algebraic group G on a finite-dimensional complex vector space V is called *polar* if there exists a subspace $c \subset V$ consisting of semisimple elements such that $\dim c = \dim V//G$ (the categorical quotient), and for a dense subset of c , the tangent spaces to the orbits are parallel; then it turns out that every closed orbit of G meets c . In this work we study the class of polar representations which are *symplectic*, namely, preserve a non-degenerate skew-symmetric bilinear form ω on V .

We first show that such representations are coisotropic and use this fact to give a classification. We also study their moment maps and prove that they separate closed orbits. Our work can also be seen as a specialization of some of the results of Knop on multiplicity free symplectic representations to the polar case.

(Joint work with L. Geatti (Università di Roma Tor Vergata).)