

Title: The Peterson Variety and the Wonderful Compactification

Abstract: We look at the centralizer in a complex semisimple algebraic group G of a regular nilpotent $e \in \text{Lie}(G)$ and show that its closure in the wonderful compactification \overline{G} is isomorphic to the Peterson variety. We generalize this result to show that for any regular $x \in \text{Lie}(G)$, the closure of the centralizer G^x in \overline{G} is isomorphic to the closure of a general G^x -orbit in the flag variety. We consider the family of all such centralizer closures and show that it has a natural Poisson structure.