

1086-VJ-1119

Emma M Norbrothen*, Box 8205, 2108 SAS Hall, Raleigh, NC 27695. *Classifying the Double Cosets $H_k \backslash G_k / H_k$ of $SL(2, k)$* . Preliminary report.

Symmetric spaces are defined as the homogenous spaces G/H , where G is a reductive group and H is the fixed point group of an involution θ . These spaces are important in mathematics and physics. Recently the study has expanded to arbitrary fields and these generalizations are called symmetric k -varieties, which are similarly defined as the G_k/H_k , where G_k and H_k are the k -points of G and H , and k is not necessarily algebraically closed.

A problem of importance in number theory and algebraic group theory is to describe the action of H_k on G_k/H_k , which can be seen as the double cosets $H_k \backslash G_k / H_k$. In the Riemannian symmetric space there is the Cartan decomposition $G = HAH$ of the group G , where A is a maximal k -split torus of G . Additionally, in real Riemannian symmetric spaces, all A are H -conjugate. In G_k/H_k , the Cartan decomposition no longer holds and not all A are necessarily H_k -conjugate. Currently I am studying the action of H_k on G_k/H_k for $G = SL(2)$, with an emphasis on the finite and p -adic fields. This is the first step to generalizing double cosets in $SL(n, k)$, quantifying the H_k -conjugacy classes of maximal θ -split tori, and characterizing double cosets. (Received September 19, 2012)