1037-22-238 **Leticia Barchini** and **Roger Zierau***, Department of Mathematics, Oklahoma State University, Stillwater, OK 74078. *On certain components of Springer fibers.* Preliminary report.

Consider the real classical groups $SU(p,q)$, $Sp(2n,R)$ and $O(p,q)$ (p and q not both odd). Let G denote the complexification of one of these groups and K the complexification of a maximal compact subgroup. The moment map $\mu : T^*X \to \mathfrak{g}^*$ for the natural action of G on the cotangent bundle of the flag variety X contains useful information about irreducible Harish-Chandra modules. In particular, if Z is a closed K-orbit in X, then the image under μ of the conormal bundle $T^*_Z X$ is the closure of a single nilpotent K-orbit $\mathcal{O}$ in $\mathfrak{p}$. This orbit closure is the associated variety of a discrete series representation, an important invariant of a Harish-Chandra module. For $f \in \mathcal{O}$, $\mu^{-1}(f) \cap T^*_Z X$ is a component of the 'Springer fiber' $\mu^{-1}(f)$. We shall give an explicit geometric description of these components. We also show how this description is used to compute the associated cycle (a refinement of the associated variety) of any discrete series representation. (Received February 04, 2008)