Title. Characteristic cohomology of the horizontal distribution on flag manifolds and flag domains.

Abstract. Let $X = G_{\mathbb{C}}/P$ be a complex flag manifold; here $G_{\mathbb{C}}$ is a complex semisimple Lie group with parabolic subgroup P. The *horizontal distribution* $H \subset TX$ is the unique, homogeneous, bracket–generating distribution on the holomorphic tangent bundle. Associated to this distribution is an exterior differential system $\mathcal{I} \subset \Omega(X)$ characterizing the integrals of H. The de Rham complex $(\Omega(X), \mathrm{d})$ induces a quotient complex $(\Omega(X)/\mathcal{I}, \mathrm{d})$ whose cohomology $H^{\bullet}_{\mathcal{I}}(X)$ is the the *characteristic cohomology* of H.

In the first half of the talk I will give a description of $H^{\bullet}_{\mathcal{I}}(X)$ in terms of Schubert classes, and show that there exists a non-degenerate Poincaré-type pairing between the cohomology and the $\mathcal{I}$–homology.

In the second half of the talk, I will focus on the restriction of H (equivalently $\mathcal{I}$) to a *flag domain* D, an open $G_{\mathbb{R}}$–orbit in X for a real form $G_{\mathbb{R}}$ of $G_{\mathbb{C}}$. Here the main result is the identification of an integer $\nu > 0$ with the property that $H^k_{\mathcal{I}}(U) \simeq H^k(U)$ for all open $U \subset D$ and $k < \nu$. Corollaries include the finite dimensionality of $H^k_{\mathcal{I}}(D)$ for all $k < \nu$, and a local Poincaré lemma for the differential of the characteristic cohomology in degree $k < \nu$.