Title: Supports of the Hitchin fibration on the reduced locus

Abstract

I'll discuss some work in progress in collaboration with M.A. de Cataldo and J. Heinloth.

Let C be a nonsingular projective curve of genus > 1, and let n and d be two coprime integers. Given the moduli space $\mathscr{M}$ of stable Higgs bundles (E, Φ), where E is a vector bundle on C of rank n and degree d, and $\Phi : E \to E \otimes K_C$ is the Higgs field, there is an associated Hitchin fibration $\chi : \mathscr{M} \to \mathscr{A}$, where $\mathscr{A}$ is the affine space parameterizing the spectral curves $C_a \subset T^\vee C$ associated to Higgs bundles. The map χ is projective, hence, by the decomposition theorem of Beilinson Bernstein Deligne and Gabber, $R\chi_*\mathbb{Q}_{\mathscr{M}}$ splits in a direct sum of (shifted) intersection cohomology complexes. We determine completely the supports of those intersection cohomology complexes which intersect the locus $\mathscr{A}_{red}$ parameterizing *reduced* spectral curves. We show in particular that, for every partition $\lambda = (\lambda_1, \cdots, \lambda_r)$ of n, there is a string of summands appearing in the decomposition of $R\chi_*\mathbb{Q}_{\mathscr{M}}$ which is supported on the locus $\mathscr{A}_\lambda$ where the spectral curve splits into r reducible components mapping to C with degrees $\lambda_1, \cdots, \lambda_r$. The proof relies on the technique of "higher discriminants", developed in collaboration with V. Shende, and on some results on the universal family of compactified jacobians, due to V. Shende, F. Viviani and myself.